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ORIGINAL COMMUNICATIONS.

SYRINGOMYELIA.

BEING THE ALVARENGA PRIZE ESSAY OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA FOR THE YEAR 1895.

(Continued from page 638.)

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The vast majority of subjects of syringomyelia, whether male or female, belong to the laboring classes, and in such patients repeated injury of a joint is liable to occur, especially if the sense of pain has been impaired or abolished. In many of these cases it requires only a slight accident to give rise to affections of the joints. It is not uncommonly observed that in cases of trophic disturbances of the skin a slight mechanical or thermic irritation is often followed by active vasomotor troubles and by various symptoms such as would not occur from similar exciting agents in healthy persons.[1]

It must not be concluded, however, from such premises that syringomyelic arthropathies are of traumatic origin. Volkmann maintained that such was the case in tabes, but his view has not been accepted, and the prevailing opinion, based on clear evidence, is that they are distinctly trophic lesions. The obscure nature of the arthropathy is borne out by the various theories that have been formulated for its explanation. That they are syphilitic as Strümpell has claimed we cannot admit, nor can we concede that they are rheumatic in origin. Buzzard's theory that they are due to an invasion of the medulla oblongata because, as he claimed, they were coincident with gastric and laryngeal crises is equally untenable. This author

[1] See cases of Jurgens and Marinesco.

fortified his position by arbitrarily assigning to the medulla a trophic centre for the bones and joints.

Believing with Charcot, Blocq, Hoffmann, Nissen, and Marinesco that the arthropathy of syringomyelia is entirely analogous in its origin to that of tabes, we deem it entirely fair to use the same arguments in support of the explanation of the nature of syringomyelic arthropathy that have been adduced to explain that of tabes.

Among the earliest investigations of this subject was that of Charcot and Joffroy in 1870 (*q. v.*). They examined the spinal cord of a woman who had had locomotor ataxia for ten years, with a large tabetic arthropathy of the left shoulder, and with complete destruction of the head of the humerus. In addition to a characteristic sclerosis of the posterior columns, there was a remarkable atrophy of the left anterior horn in the cervical region, with destruction of many cells particularly in the posterior external group. At other levels the anterior horns were normal.[1]

In another instance Charcot and Joffroy found an atrophy of the anterior horn of the lumbar cord coincident with arthropathy of the knee of the same side, and they believed them to be in the relation of cause and effect. Later investigations by Pierret (1870), de Lionville (1874), and Seeligmüller seem to support this view; but those of Bourceret (1875), Raymond (1875), Pitres and Vaillard (*Revue de Médecine*, 1886), and Pavlides (1888) have afforded negative observations. Talamon also failed to find any lesion of the anterior horns in several autopsies in cases of spinal arthropathy. Pitres and Vaillard did find, however, in four cases of tabetic arthropathy alterations of the periarticular nerves, and even of the capsular filaments, and from these observations they announced the theory of the peripheral nervous origin of the affection, in which they have been supported by Siemerling.

Marinesco has examined the spinal cord (*Revue Neurologique*, July 30, 1894), the crural nerves, and articular filaments in a case of double tabetic arthropathy. The cord showed a system-sclerosis of the posterior columns, having its greatest intensity in the lumbar region. In this situation there remained in the posterior columns only a few scattered fibres in the cornu-commissural zone. There were still a few fibres scattered through the other zones of the posterior columns. The zone of Lissauer was completely degenerated, as well as the posterior horns. The anterior horns were normal throughout the entire lumbar region. The crural nerves on both sides showed well-marked degeneration, which appeared particularly in certain bundles of fibres,—in other words, there were atrophied medullated nerve-fibres. The articular nerves had also degenerated.

Finally, in a well-marked case of arthropathy in general paresis, studied by J. H. Lloyd, an illustration of which is presented for comparison, it

[1] It will be noticed in this connection that the arthropathies of syringomyelia are chiefly in the upper extremities, and that the usual site of the central lesion is in the lower cervical and upper dorsal regions.

could not be affirmed that a direct connection was apparent between the cord lesions and the arthropathies, but the opinion was expressed that this connection existed probably by way of the nerve-roots. The spinal cord in this case showed, first, partial posterior sclerosis, and, second, sclerosis of

FIG. 16.

Arthropathy in general paresis. (From a case of Dr. Lloyd, in the Philadelphia Hospital.)

the motor tracts from one hemisphere,—*i.e.*, the crossed pyramidal tract on the right side and part of the direct pyramidal tract on the left side. The multipolar cells of the anterior horns in the region examined (mid-dorsal region) did not present very marked changes.

We are very much in need of a further study of the nature of syringomyelic arthropathy.

The arthropathies of syringomyelia, as well as of tabes, have been arranged under two heads: first, the atrophic form, which is the rarer; and, second, the hypertrophic form, more usually seen, and which resembles in some respects the lesions of arthritis deformans.

Recent investigations lead to the opinion that a lesion of the articular sensory nerves is accountable for these arthropathies. Goldscheider's observations show that the articular surfaces are sensitive to mechanical and thermic irritations. Recent studies by Golgi show that numerous sensory nerve-corpuscles exist in the tendons themselves, but no one has yet described trophic nerves passing from the centre to the periphery in a manner analogous to the nerve-fibres of muscles and glands. "We may then understand how, in the atrophic form of arthropathy, at least the articular surfaces of the bones, deprived of their sensory nerves by degenerative processes, are thereby unable to recognize the adverse conditions to which they may be subjected. The nutritive function being dependent on intact sensory innervation is, therefore, abated as the communication with the vasomotor centres is gradually lost. The resulting impoverishment of the blood-supply results in the wasting and reabsorption of the constituents of the articulation."[1]

On the other hand, an ingenious theory is advanced to explain the hypertrophic form. "It is a recognized fact that in healthy individuals there are certain spontaneous compensations of nutrition. Applying, now, the same principles in pathologic conditions, it may be urged that in some forms of arthropathy, for example, portions of an articulation are deprived of a regular nutritive circulation because their centripetal nerve-supply is impaired. Thus it may occur that the neighboring portions remaining unaffected enjoy a compensatory increase of nutrition corresponding to what has been denied the affected regions." However this may be, hypertrophies do occur in the neighborhood of those portions of joints that have undergone impairment of innervation. The *modus operandi*, according to Marinesco and others, is, therefore, a mechanism which, starting in the centripetal nerves of the articulation, reacts in such a way upon the vasomotor centres, and thence again to the vasomotor fibres distributed to the articular surfaces, that the trophic changes result.

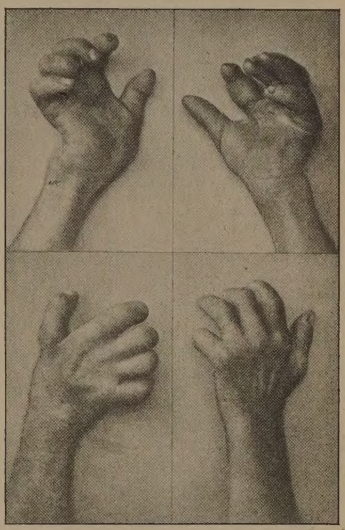
To sum up the determination of the two forms of arthropathy as observed in syringomyelia, tabes, etc., we may say that if there exists only an impaired action of the sensory nerves, by which they are incompetent to transmit impressions from the joint to the centre, the atrophic form of arthropathy will result. If now there is added a compensatory adjustment by which fibres remaining intact bring about an increase of nutrition to the surrounding unaffected portions of the articulation, we will have the phenomena of hypertrophy.

Attention is drawn to the influence of pathogenic microbes in the pro-

[1] Marinesco.

duction of arthropathies. Where innervation is impaired the tissues, particularly at the extremities, are not well able to resist the invasion of microbes. Such affected areas constitute the points of least resistance, where their penetration is easy and their multiplication undisturbed. Those changes of infectious nature are well seen in Morvan's type of syringomyelia, and in a case of combined syringomyelia and leprosy,—such as, for instance, one reported by Souza-Martin. As in the arthropathy of hemiplegia, so in Morvan's type of syringomyelia, the changes are due to the combined influence of a direct pathological process involving the central nervous system and, in addition, the action of pathogenic microbes which have been introduced from without at a vulnerable point.

Fig. 17.



Arthropathy of Morvan's type. (Curschmann's case.)

We have referred to the resemblance which the hypertrophic arthropathy of syringomyelia may bear to arthritis deformans. Volkmann endeavored to make the anatomical distinction in these cases that in the latter disease the formation of new bone is confined to the interior of the joint capsule, while in the spinal arthropathies there may be extensive ossification of the periarticular soft parts with formation of osteophytes. Such a distinction, however, does not hold, for examples of arthritis deformans are met with on post-mortem examination in which there were abundant bony formations outside the limits of the affected joint, and especially in the adjacent tendons and ligaments. The articular surfaces co-ossified in places may be deformed either by partial fractures or by osteophytes with which they are surrounded. Isolated bony growths, developed in the tendons or aponeuroses, seem to be met with more often in syringomyelia than in tabes.[1]

In the hypertrophic form the ligaments and the capsule of the joints involved are relaxed or destroyed, with a consequent mobility of the adjacent ends of the bone. Such was the condition in a patient of Dr. Alexis Thomson, of Edinburgh. (Fig. 15.) A similar condition was also seen in Dr. Dercum's case at the Philadelphia Hospital. (Fig. 18.) Dr. Thomson calls attention to the fact that it is clearly the duty of the surgeon in all cases of unusual forms of joint-disease, repeated dislocation, or spontaneous

[1] For example, in a case of Hoffmann's, of syringomyelic arthropathy, there was an osteoma of the anconeus muscle.

fracture, to investigate accurately the sensibility to pain and temperature,—features which will occupy our attention later,—for otherwise this disease will continue to escape recognition in surgical practice.

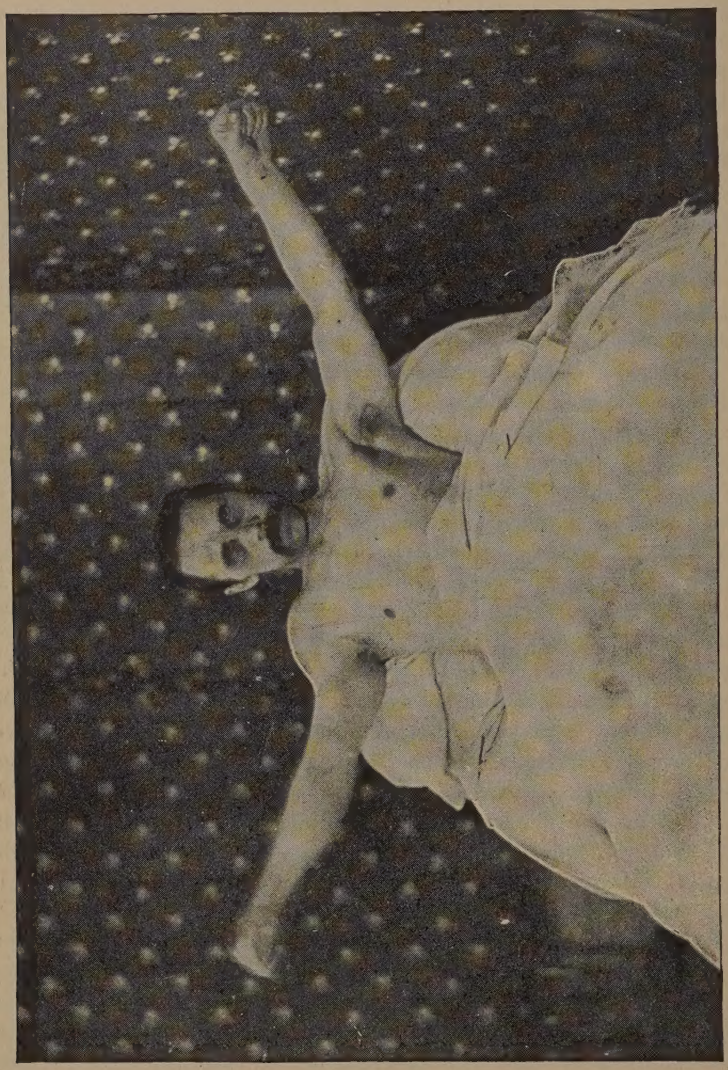


FIG. 18. Arthropathy of the shoulder. (Case of Dr. Dercum, in the Philadelphia Hospital.)

(*d*) *The Bones.*—Lastly, we may have serious alterations of the shafts of the bones. Fractures occasionally occur spontaneously, or by slight efforts or accidents. These fractures, like the arthropathies, are painless, and hence may escape detection for a considerable length of time. Union is delayed, and there is a great liability to vicious or redundant callus. In

some cases the fracture remains ununited, and a false joint forms. One of the best illustrations of fractures of this kind is that of Schultze, cited by Thomson and Bruhl. It occurred in a healthy man, aged twenty-four, in whom the first evidence of syringomyelia was a "spontaneous" fracture of the humerus, caused by an energetic muscular effort. Because of the loss of sensibility to pain this patient only knew of his fracture by the noise of the break and by the loss of power in the limb. He subsequently fractured his left radius and fifth metacarpal,—all bones of the upper extremity. After death, at a later period, of septic meningitis, Schultze found that all the fractures had united in a satisfactory manner, and that there was no abnormal fragility of the bones, such as might have been reasonably expected. He endeavors to explain the liability to fracture in these cases by the loss of the muscular sense and of sensibility to pain, allowing the patient to exert more muscular effort than is required for the object in view or than the bone can stand.

Lastly we may have trophic changes in the bones, particularly of the hands and fingers, that partake of the nature of acromegaly.[1]

(2) *Deviations of the Spinal Column.*—Changes in the spinal column have been observed in so many cases of syringomyelia that they have come to be regarded as a characteristic symptom. Lancereaux was probably the first to notice this in a case of syringomyelia, which he described in 1861 under the name of hypertrophy of the ependyma. Although the earlier observations on syringomyelia generally made no mention of the state of the spine, it is now given a prominent place in the symptomatology of the disease. In an analysis of the one hundred and eighteen cases found in the appendix, we find that deviations of the spinal column are noted in forty-four cases. Bruhl states that this frequency is about fifty per cent. and Schlesinger gives forty per cent. The more carefully the examination is made the more likely will the percentage be found to be increased. The accompanying photograph of one of Curschmann's cases shows this deformity in a marked degree. In one of the cases described by the author (case of Robert Collins, see Case No. I.)[2] there is

Fig. 19.

Scoliosis in syringomyelia. (Curschmann's case.)

[1] See cases of Marie, Holschevnikoff, and Peterson.

[2] See Cases XXVII., XXXIV., XLIX.

a marked deformity. Hallion, Hoffmann, and Jeffries have also published excellent examples.

The usual form of deviation is scoliosis; in some cases this is associated with kyphosis. Pure kyphosis is very rare, but has been observed in the cervical region. Lordosis is uncommon, but when present may be looked for in the lumbar region.

Scoliosis may involve, together with the compensatory curves, the entire length of the spinal column, but the favorite seat is the dorsal region. The convexity of the curve looks usually to the side which is affected earliest and on which the muscles are impaired. This impairment allows the stronger muscles of the opposite side to contract more effectually, with the result that a convexity on the opposite side of the spinal column is produced. This deformity, obviously, is more marked in cases where the disease is unilateral.

Exceptions to this may occur, as, for instance, in a case of Kahler's in which the spine was normal, although there was a strong predominance of the disease on the left side; but in this case the muscles of the trunk were believed to be spared.

In one hundred and eighteen cases analyzed in appendix, scoliosis was noted in thirty-six.

Convexity to right	13
Muscular defects began in right	10
Muscular defects began in left	2
Convexity to left	8
Muscular defects began in right	2
Muscular defects began in left	3

Although there may be considerable difference in the height of the shoulders, immobilization of the corresponding part of the spine and other evidences of deformity, there is, as a rule, no special pain or discomfort. Should pain exist in an exceptional case there is no evidence that it is due to a meningitis. There may, however, be a certain degree of pain on pressure with stiffness of the affected portion of the spinal column. This may vary as to the time at which it is apparent, either early or late in the history of the affection. The curvature itself may be coincident with the earliest symptoms, but ordinarily it is apparent several years after the onset of the disease. In cases, such as one published by Bruhl, where the scoliosis was observed at the age of sixteen and a half years, but where the disease did not commence to be marked until the thirty-third year, we may fairly question the relationship of the two. It is not possible in most cases to state the exact time at which the deviation occurred, since no pain is present and as it is not ordinarily noticed until actual deformity appears.

The nature of deviation of the vertebral column as observed in syringomyelia has given rise to various opinions. Roth believes that scoliosis is of muscular origin, arising from an atrophy of the "muscles transversaire epineux," which may exist early in the case. We have noted

in a study of cases given in the appendix that atrophy of the trapezius (cucullaris) is rather frequently noted. The origin of this muscle embraces the entire extent of the spinal column above the first lumbar vertebra, and it can readily be understood how atrophy of it or of any considerable portion of its fibres may affect the direction of the spine.

It is quite probable that the muscles are not alone in their influence in causing deviation of the spine in this disease. The tendency to affections of the joints and of the long bones in syringomyelia would suggest that the vertebræ and their articulations may share the trophic change, which is more evident in other localities, so that we may hold, in view of the facts that have been presented, that the scolioses or the more pronounced deformities are evidences of trophic disorder dependent on the changes in the gray matter of the cord. In this respect we see in it a strong analogy to the spinal deviation observed in Friedreich's ataxia.

(3) *Vasomotor Disturbances.*—These changes are commonly observed and give rise in some cases to considerable distress. The superficial circulation in the affected areas is disturbed, being either inadequate to proper bodily comfort or, on the other hand, by its excess giving rise to redness, swelling, and actual elevation of the local temperature. In the first instance a sluggish circulation is naturally attended with a chilling of the part and a cyanotic appearance of the extremity involved. The surface temperature is lowered and the patient may complain of a sense of cold. Subjective sensations of cold in cases where no objective symptoms are apparent are common, and in many cases these feelings are distributed over a large area. The patient complains of coldness of a limb or of a sense of cold water running down the back. On the other hand, the sensation may be of burning or smarting and may vary very much even in the same individual.

The skin itself quickly responds to external stimuli, so that a slight stroke along the skin of the back will leave a reddish line, which persists for some time after the stimulus has been applied. This feature is common in spinal disease under the name of dermographism or "homme autographique," and is therefore of diagnostic value only when taken in connection with other more characteristic symptoms. So also œdemas are noted in this disease and are distinctly of nervous origin. They are observed, when present, on the dorsum of the hand or in the lower part of the forearm. The "tumeurs pateuses" observed by Roth are doubtless of this nature.

Disturbances of the secretion of sweat are quite commonly observed, excessive in some regions while suppressed in others. The excess is generally observed in the anæsthetic areas. French writers, including Dejerine, Grasset, and Bruhl, and Schultze and Fürstner and Zacher, in Germany, have made interesting observations on this point.

(4) *Disorder of the Sphincters.*—These are rarely disturbed.

In the first case summarized in our appendix, that of Abbe and Coley, there was partial loss of control of the bladder and rectum, and before death

a violent cystitis ensued. In a case of Charcot's death was caused by a spontaneous perforation of the bladder following a simple ulcer. In a case of Oppenheim's also death was due to bed-sores and cystitis.

Incontinence of the bowels is rare but constipation is commonly noted. In Preobrajensky's case (No. LXXIX.) there were retention of urine and incontinence of fæces; death occurred in the course of three weeks from pyelonephritis and purulent cystitis.

In traumatic cases, where great violence is done to the cord with accompanying paraplegia, we naturally look for incontinence of fæces and retention of urine. In Schlesinger's recently published case (No. XIV., Monograph, 1895) the above symptoms were present as a result of luxation of the twelfth dorsal vertebra with compression of the cord. At the autopsy, three months later, a dilatation of the central canal was found throughout the entire dorsal cord above the point of luxation. Cystitis and pyelonephritis were also present.

(5) *Ocular Symptoms.*—The disturbances of the eyes in syringomyelia may be properly considered under a separate heading, although they are closely related to the bulbar symptoms which will be more fully considered later.

Pupils.—Inequality of the pupils is not an uncommon symptom. In the one hundred and eighteen cases found in the appendix we find this noted twenty-seven times. (Cases III., V., X., XVII., XXVI., XXVII., XXXV., XXXVI., XLI., XLII., XLIII., XLIV., XLVI., XLIX., LVIII., LXIII., LXIV., LXXII., LXXIII., LXXVI., XCI., C., CV., CXIII., CXVI., CXVIII.)

In eighteen cases the right pupil was the larger; in six cases the left. Bruhl records this symptom ten times in thirty-six cases and Schlesinger twenty-four times in two hundred cases in all the literature accessible. By adding the cases of inequality of the pupils due to paralysis of the sympathetic the proportion rises to twenty-five per cent. Paralysis of the sympathetic nerve may occur from lesion of the cord in the upper dorsal region; it is generally unilateral, but bilateral paralyses have been recorded by Schlesinger, who remarks that it is one of the initial symptoms of syringomyelia, particularly of the cervical type and those that are accompanied by marked muscular atrophy. The pupils in almost every case observed reacted to both light and accommodation. In case No. LXXII. which we report convergence to light was absent. Immobility of the pupils with inequality is noted in a very few cases of syringomyelia as well as tumors of the spinal cord. The case of Oppenheim (G. P.[1]) is an example, and other cases have been recorded by Glaser, Schultze, Homen (*q. v.*), Bruttan, and Tornow.

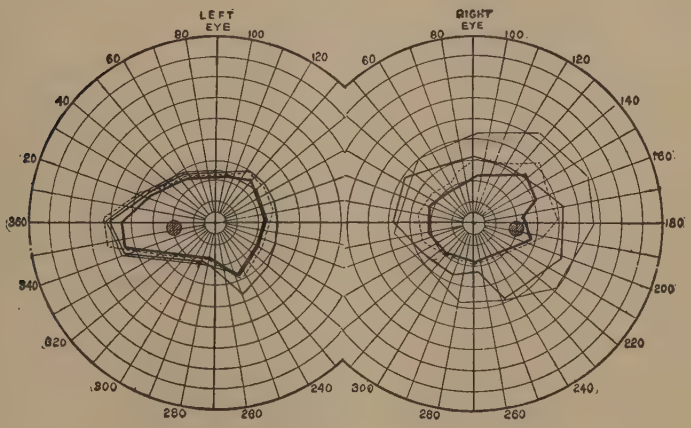
Nystagmus is not an unusual symptom. We find that it is noted fifteen times in one hundred and eighteen cases, and is usually horizontal, but may

[1] Archiv für Psychiatrie, 1893, p. 324.

be vertical or diagonal. It is one of the earlier symptoms, and is indicative of lack of muscular tone and co-ordination of the motor apparatus of the eye. In this respect it is entirely comparable with the nystagmus of Friedreich's disease.

The visual fields are occasionally narrowed. This was noted in the case of two men in a total of seventy-three men, and in five women in a total of thirty-eight women. French authors believe that this symptom is confined to cases complicated with hysteria, but this statement may fairly be questioned. The two cases which have been reported by Eskridge have been very carefully studied in this respect, and both showed narrowing of the visual fields. Neither of these could be construed as hysterical. Especially in the case of one of them (George S.) was this considered and ruled out. On roughly testing the eyes there was "an apparent approach to left lateral homonymous hemianopsia," but by repeated careful tests with the aid of the perimeter (see accompanying figure) it will be seen that while

FIG. 20.



Contraction of the color-fields in a case of syringomyelia.

all fields are lessened, the left eye showing the greatest contraction, there is not a condition of hemianopsia. Two examinations were made thirty-nine days apart. Schlesinger cites twenty cases occurring in more hysterical subjects where there was narrowing of the visual fields and sixty-seven cases where the fields were definitely known to be normal. When narrowing does occur it is found chiefly in the color fields, particularly green. Scotoma has not been observed. The condition of the external ocular muscles is not commented on excepting in very few cases. In these convergent strabismus from early childhood was noted six times. (Cases XXXIII., XL., LIV., LXVII., LXXX., CXI.)

The ophthalmoscopic appearances when mentioned are usually negative. In Eskridge's second case, that of Jesse C. (No. XVIII.), the disk of

the right eye was of a grayish-white color, with a central physiological cup; its edge was sharp; the sclerotic ring was seen around the disk rather more clearly on the temporal than on the nasal side. Two small pigment deposits were seen in the upper inner quadrant of the fundus about the diameter of the disk from its margin. The fundus of the left eye presented very much the same picture as that of the right, both having the appearance of commencing gray atrophy. The color-fields of these eyes are published in "International Clinics," 3d Series, vol. iv. p. 135.

In rare cases amblyopia or even amaurosis from atrophy of the optic nerves has been recorded.[1]

(6) *Bulbar Symptoms.*—The invasion of the medulla oblongata by the glioma or by the formation of a cavity gives rise to a distinct train of symptoms. Among these laryngeal palsies assume a prominent place. Sensory paralysis of the larynx is somewhat uncommon, but motor paralysis is the form more frequently observed. The motor derangement consists more frequently in interference with phonation than in disturbances of respiration. Unilateral paralysis of the recurrent laryngeal branch of the pneumogastric is the commonest form observed. The paralysis is usually unilateral but in exceptional cases may be bilateral.

Where bulbar involvement is marked we have more extended paralysis of motion. The muscles of the pharynx, the tongue, the lips, and even the facial muscles may be involved. It thus happens in a well-marked case that the expression of the face is altered, owing to paralysis of motor branches of the trigeminus. The lips are unable to perform the act of suction, prehension; the patient is unable to whistle. Mastication is interfered with and solid food requires to be washed down with water; saliva becomes unmanageable owing to the difficulty in swallowing it. The motions of the tongue are impaired and its structure undergoes atrophy on one or both sides,—speech is thick.

Sensory changes, if sought for, will be found, in a typical case, to be present within the mouth, the throat, and the larynx, as well as the external portions of the body. In a case carefully studied by S. Solis-Cohen all the foregoing symptoms were found, and extensive sensory changes as well. While tactile sensation was almost perfectly preserved, it was found that at times there were places on the face, lips, and within the throat where it seemed blunted. The temperature sense was found to be both blunted and perverted on the right side of the face, while at the base of the tongue, in the œsophagus and the larynx, it was blunted but not lost. Taste was absent from the anterior portion of the tongue in the distribution of the gustatory branch of the nerve.

Other bulbar symptoms, such as vertigo, attacks of transient blindness, etc., may be noted, as has been recorded in the case referred to.

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[1] See cases recorded by Simon, Schultze, Westphal, Furstner and Zacher, Eickholt, Glaser, and Schuele.

Laryngeal symptoms are generally gradual in their onset and pursue a chronic course. Should, however, bulbar manifestations occur suddenly by apoplectiform attacks they would probably be of a hemorrhagic nature, and would be accompanied by vertigo, clouding of the mind, and even complete loss of consciousness, possibly with vomiting. This symptom might mark the extension of the glioma into the brain if accompanied with severe headache. Disturbances of hearing, of central origin, and the occasional appearance of polyuria may be added to this group of symptoms.[1]

3. *Symptoms of Posterior Poliomyelitis.*—Degeneration or excavation of the posterior horns of the cord gives rise to the most characteristic symptoms of syringomyelia. Disturbances of sensation are among the earliest features which can be traced in the history of most cases, and careful inquiry will almost always reveal incidents depending on the loss of pain sense or heat sense that antedate by several years the symptoms which lead a patient to consult a physician. But sensory disturbances are not always apparent. There are exceptional cases in which such unusual variations from the classical type have been present that the most accomplished clinicians have been led into error. It was just in this respect that Raymond was led into a mistaken diagnosis of a case, for it was only during the last fifteen months of the patient's life that any sensory changes were found although carefully searched for. Rare cases of this kind, in which during the entire course of the disease no sensory changes have been noted, are recorded by Schuele, Schültze, Krauss, Strümpell, Bernhardt, and Parmentier.

In a case recently reported by Schlesinger (Case VI., Monograph, 1895), a woman, aged thirty-nine years, presented no loss of sensation in any form. The pressure sense, localization sense, pain sense, and temperature sense, for both warm and cold, were normal; there was, however, hyperæsthesia and hyperalgesia. The clinical diagnosis of syringomyelia was made by both Schlesinger and Ewald on the strength of other symptoms. Death followed a surgical operation, and a cavity extending from the lumbar region throughout the entire dorsal and cervical regions was demonstrated at the autopsy.

The forms of anæsthesia which require investigation in a suspected case of syringomyelia are as follows:

Thermo-anæsthesia (almost invariably present).

Analgesia (generally present).

Tactile anæsthesia (rarely present).

Loss of muscular sense (rare).

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[1] See articles by Herman F. Müller, A. Raichline, S. Solis-Cohen, H. Schlesinger, Klebs, Krauss, Grasset, and Adolf Schmidt.

The author would also call attention to the extraordinary statement by Dr. Frederick I. Roberts (Theory and Practice of Medicine, Ninth Edition, 1894, p. 1108) that there is no bulbar involvement in syringomyelia.

Loss of pressure sense (rare).

Loss of localization sense (rare).

It is quite unusual to find present in any given case thermo-anæsthesia, analgesia, and tactile anæsthesia, a condition conveniently expressed as triple anæsthesia. The symptom complex, which is considered almost pathognomonic of the disease, is a combination of thermo-anæsthesia and analgesia with preservation of tactile sensation. This constitutes the famous "dissociation symptom," as Charcot has designated it.

This dissociation of sensibility is not confined, however, to syringomyelia; it is found in the case of several affections of the nerve-centres, very frequently, for example, in cervical pachymeningitis; occasionally in neuritis, hysteria, alcoholic neuritis, traumatic neuritis, leprosy, hæmatomyelia, locomotor ataxia, and extramedullary tumor of the cord; and in mixed cases where there is injury both to the cord and to the nerve-roots. Two cases illustrative of the latter condition, in which the dissociation symptom was well marked, have been recently published by Lloyd, under the title of "Traumatic Affections of the Spinal Cord simulating Syringomyelia."[1] In the first of these cases a man, in falling from a scaffold, struck the back of his neck, and was believed to have sustained a fracture of the spinal column. The entire body, including both arms and legs, was paralyzed. He recovered from this, and eight years later he fell again and struck the back of his head and spine between the shoulders. Partial recovery took place, but an examination ten years afterwards revealed to some extent the dissociation symptom. There was anæsthesia to cold; cold objects in the affected area, as shown in the charts (Figs. 2 and 3, *loc. cit.*), were called hot. Analgesia of the right side was present, while tactile sensibility was everywhere good.

In a second case a laborer, at the age of thirty, injured his cervical and dorsal spine by having fallen into a canal and being jammed between two canal-boats, and was unable to resume work for three months. At the age of fifty-seven he was severely injured by a fall of a bank of earth. After twenty-four hours' unconsciousness he was found to be paralyzed in the left arm and leg. Three years later an examination showed, in addition to angular deformity of the spine, atrophy and fibrillary contractions of the left shoulder girdle muscles, a noteworthy disorder of sensation. (See Figs. 5 and 6, *loc. cit.*) The patient was unable to distinguish heat from cold or to recognize either in the region marked on the chart. The thermo-anæsthesia was on the right side, the side opposite the paralysis of motion. There was an area of tactile anæsthesia (not portrayed on the chart) involving the right leg.

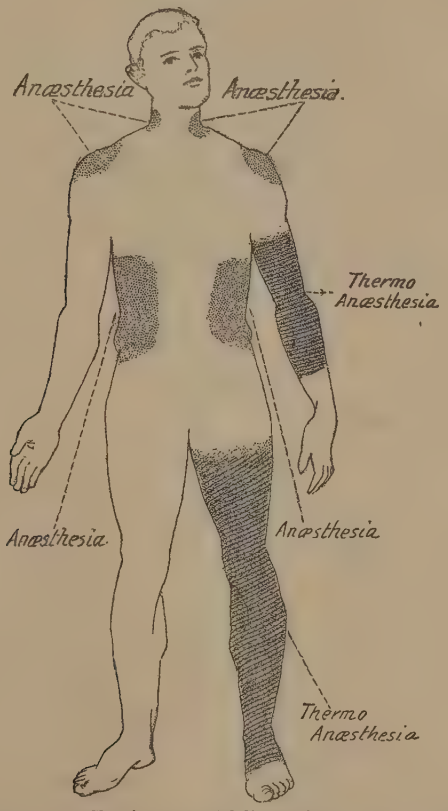
It may be possible that in these cases where trauma has played such a conspicuous part the conditions may be explained by the subsequent discovery of hæmatomyelia and consequent excavation, the "myelite cavitaire"

[1] Journal of Nervous and Mental Disease, June, 1894.

of French authors. However this may be, this author did not feel justified in making a diagnosis of syringomyelia, in these cases at least, in the present stage of their clinical manifestations. On the other hand, it is quite likely that in less careful hands a positive diagnosis would be claimed.[1]

Thermo-Anæsthesia.—Loss of power to recognize heat and cold is probably one of the earliest symptoms; it is a prominent feature all through the history of the majority of cases, although varying considerably in its extent

FIG. 21.



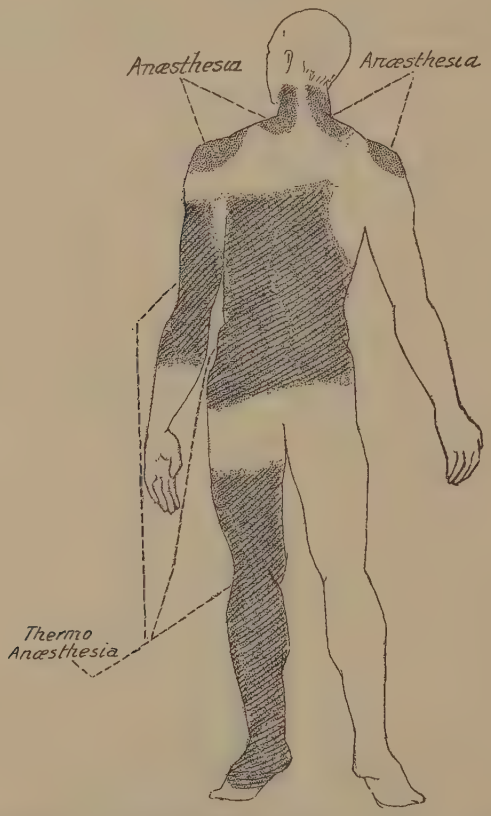
SYRINGOMYELIA.—Showing segmental distribution of sensory symptoms.

and in its degree in individual instances. It is most commonly found in the hands and fingers of one side, or it may extend throughout one or both upper extremities, or be in a measure present throughout almost the entire area of the body. Thermo-anæsthesia is commonly limited by the median line of the body, and in these cases where both upper and lower quadrants are involved is sometimes described as hemiplegic thermo-anæsthesia.

[1] See, also, a publication by R. Verhoogen, entitled "Dissociation de la Sensibilité dans un Cas de Lesion des Nerfs du Plexus brachial." Brussels, 1894.

The line of demarcation between the normal and abnormal area is generally quite sharply drawn; particularly is this the case on crossing the median line from the affected to the unaffected side.

Fig. 22.



Syringomyelia.—Showing segmental distribution of sensory symptoms.

In its distribution, thermo-anæsthesia sometimes involves the face (ascending branch of the fifth nerve); more often it affects the sides and back of the neck and is likely to be limited by the hair of the scalp behind (distribution of the occipitalis major and minor). It is obviously more likely to be discovered in the exposed areas of the skin, but on careful exploration areas on the thorax, horizontal belts in the abdomen, or possibly areas in the outer aspects of the thighs may be discovered. Charcot associates its distribution rather oddly with the names of garments for the various localities; thus he makes out the "forme de gant, de manchette, de manche, de bas, de culotte, de jambe de pantelon, de petite veste," etc. The distribution is sometimes symmetrical; it is usually progressive in character.

To elicit information in a suspected case of thermo-anæsthesia it is customary to use two test-tubes of precisely similar form and appearance, one containing hot water and the other cold. It is preferable to use a small object like a test-tube instead of a more bulky bottle, for the reason that normal skin areas adjacent to the affected regions may be sensible to radiation of heat from a larger mass. The wide difference of temperature present in the tubes at the start tends to grow smaller as the examination progresses unless precautions are taken. It is therefore desirable to know, by using a thermometer, the exact temperatures of the testing apparatus. Charcot used a surface thermometer, the bulb of which was inclosed in a metallic cylinder filled with copper filings. By these means the temperature acquired on placing the instrument over an alcohol-lamp may be maintained for a considerable time. (See also article by Leegaard.) Glass balls provided with a perforated cork for the passage of a thermometer and half filled with water may be used.

The glass ball can readily be heated in an alcohol flame as far as 212° F. Great care should be used in tests with temperatures above 180° F., as too long a contact might produce burns, the healing of which would be troublesome.

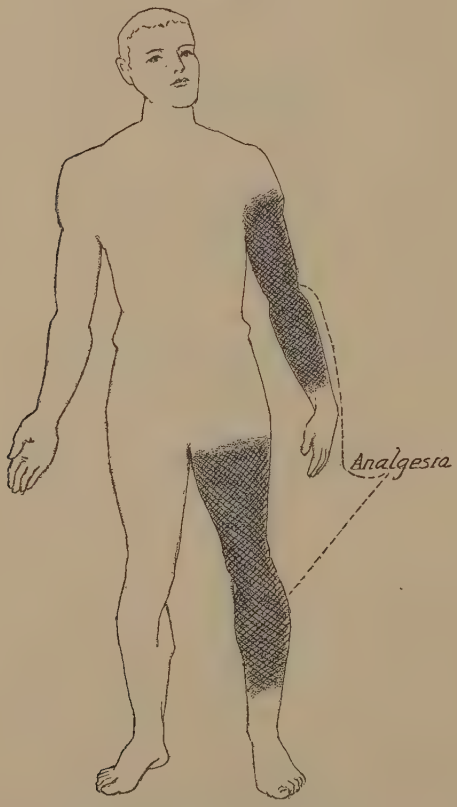
Thermo-anæsthesia may be said to be complete when the patient fails to recognize either ice when placed on the skin or an object heated to near the boiling point. Such extreme loss of temperature sense is not commonly met with, and the recognition of intermediate grades becomes necessary in most cases. Any one who fails to distinguish differences of 5° C. or 9° F. may be said to have thermo-anæsthesia (Roth). There is need in difficult or doubtful cases to make numerous examinations with relatively slight differences of temperature, especially in the moderate ranges between 80° and 140° F.

Normal individuals vary very greatly in their acuity of perception, and the time reaction varies in different cases. So also allowances must be made for the natural variations of acuteness of sensation in various parts of the body. According to Weber and Nothnagel, .40° C. can be distinguished at the finger-tips in favorable subjects; such fine differentiation is wholly impossible without the most delicate and reliable instruments, and would fail in persons whose perceptive powers are normally more sluggish. It is also shown that at extreme temperatures at either end of the scale slight differences are not so readily recognized as at the more moderate ranges. High temperatures may be recognized simply as painful if test is made in the back, the thorax, etc., while at certain sensitive points, as, for instance, the finger-tips, they may be recognized in their true character. In other cases the sense is perverted, giving rise to hyperæsthesia or complete reversal of the sense of heat and cold. In one of Bruhl's cases the skin of the right half of the thorax was sensitive to thermic impression in an exaggerated manner.

The application of tests of various degrees of cold is not quite so easy

on account of the difficulty in securing a series of different temperatures below that of the surrounding air. On this account abnormalities in the sense of cold are doubtless frequently overlooked. Error in the estimation of the degree of thermo-anæsthesia is liable to happen by reason of daily, and, it has been suggested, by hourly variations in the areas of distribution and in the intensity of sensation. Such cases are recorded, and serve to explain discrepancies which arise in clinical studies.

Fig. 23.



Syringomyelia.—Showing segmental distribution of sensory symptoms.

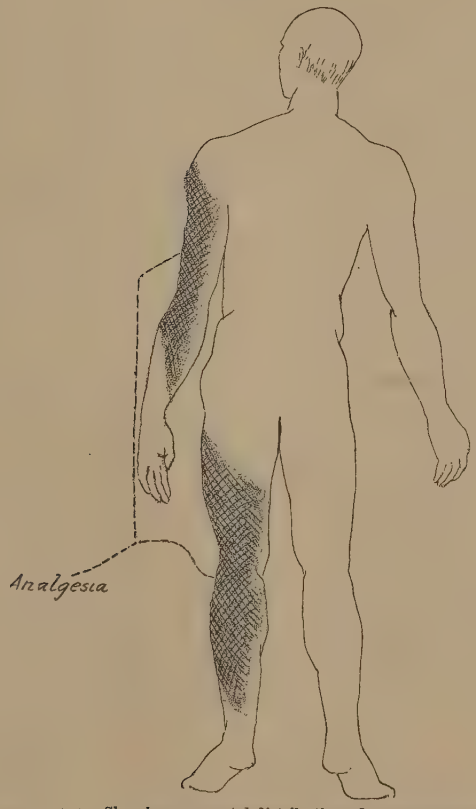
In general the same regions that are insensitive to heat are also insensitive to cold, but one area is not always exactly superimposed upon the other, and this fact had led to the belief in the probability of the existence of special nerve elements for the transmission of the sensations of heat and of cold. Cases are cited in which warm objects are recognized over certain areas, while cold objects are not recognized in the same location.

It should be mentioned in connection with thermo-anæsthesia that the

mucous membrane occasionally is involved as well as the cutaneous surface.

Analgesia.—Loss of the sense of pain in certain areas is one of the cardinal symptoms of syringomyelia. In its distribution it occurs in general in the same areas as in the case of thermo-anæsthesia. (Figs. 23 and 24.) It may be of various degrees from partial to absolute loss of pain sense. The prick of a pin is not recognized as painful. So profound is the anal-

FIG. 24.



SYRINGOMYELIA.—Showing segmental distribution of sensory symptoms.

gesia in some cases that abscesses have been opened and even fingers amputated and joints excised without a particle of pain. As we have previously mentioned, fractures may occur without any pain being felt. On the other hand, in exceptional cases hyperæsthesia has been recorded in place of analgesia. Charcot explains this by conceiving that the period of destruction of the nerve elements is preceded in some way by a period of irritation. Hyperæsthesia, when present, is more likely to be found in the lower extremities.

In estimating the degree of analgesia it should be borne in mind that individuals of the same class at different times vary greatly in this regard, and still more noteworthy is the difference between different classes of subjects. The subject of dermal pain has been investigated by Mr. Griffing, of Columbia College, New York. He shows that in kilogrammes the required amount just causing pain was as follows:[1]

	Kilogrammes.
For boys	4.8
For college students	5.1
For law students	7.8
For women	3.6

II. *Extrinsic Symptoms.*—Symptoms due to

1. Sclerosis of the lateral columns.

2. Sclerosis of the posterior columns.

These symptoms are due to alteration of the white substance of the cord, and have been termed by Charcot "symptomes leucomyeliques." They are naturally late in their manifestation, and indicate that the glioma has passed, in its influence, beyond the bounds of the gray matter, and that it or the resulting cavity intrenches on the lateral or posterior or other columns by pressure or actual degeneration.

1. Lateral sclerosis is recognized by well-known motor symptoms. Symptoms of spastic paralysis may be of all grades from moderate paresis with some stiffness to the complete stage where contracture supervenes. An early indication of this change is an exaggerated knee-jerk, and in an advanced case the addition of ankle-clonus. In sixty-one cases out of one hundred and eighteen the knee-jerk was plus.

Spastic symptoms were noted in our list of one hundred and eighteen cases in eighteen instances.

2. Symptoms due to sclerosis of the posterior columns or tabetic symptoms are thought to be more common than the spastic symptoms. The well-known distinguishing signs are motor incoördination, defective station with eyes open or closed, lancinating pains, and loss of knee-jerk. We have noted tabetic symptoms in nine cases out of one hundred and eighteen. In a later chapter on the forms of syringomyelia we will refer to this subject again. In one hundred and eighteen cases the knee-jerk was absent in six, diminished in four, normal in twelve.

Tactile Sensibility.—This is, as a rule, preserved in syringomyelia, and constitutes, by its presence and by the absence of pain and temperature sense, the well-known "dissociation symptom."

In some analgesic areas there is occasionally observed a lowering of the tactile sense,—hypoæsthesia. This is tested by noting whether there is any deviation or disappearance of the appreciation of ordinary contact, of tactile

[1] Transactions of the American Psychological Association, December, 1894.

pressure, of simultaneous tactile pressures, of the appreciation of outline (relief), and of the tactile perception of liquids.

Absolute tactile anæsthesia is altogether exceptional, but, of course, where complications are present involving the white matter of the posterior columns, we naturally would expect disturbances of tactile sensation. The allied forms of sensation, the muscular sense, pressure sense, localization sense, etc., are almost always preserved in syringomyelia. It has been claimed that in some cases the sensation of skin pressure was entirely absent or at least very much diminished, while the deeper pressure sensation was normally preserved.

The Paths of Sensory Impressions.—This subject opens a very interesting field for investigation, and one where many discoveries are yet to be made. Investigations that are purely anatomical and physiological bearing upon this subject have received considerable aid from the clinical study of syringomyelia. It is a subject that also interests the psychologist. There seems to be a general agreement that the nerve fibres for the conduction of pain and temperature run in different tracts from those that conduct ordinary tactile sensation. Professor Schiff has always maintained that the gray matter conducted thermal and painful sensations, while the posterior columns conducted the tactile and muscular sense. Brown-Séquard differentiates this further, declaring that the central part of the gray matter serves for the conduction of the sense of temperature, its posterior and lateral parts for that of pain, while the posterior columns of the cord convey tactile sensibility, all three forms previously decussating in the median line. Gowers says that after decussation in the posterior commissure, the fibres subserving sensibility to pain pass upward on the antero-lateral ascending tract, and that those subserving temperature probably pass up in their immediate vicinity. Gowers quotes a case of injury to the cord in the upper cervical region involving the lateral column and gray matter, as the result of which there was an entire loss of sensibility to pain on the side of the body opposite to the lesion without any loss of tactile sensibility. "Experiments seem to show that tactile sensibility is conducted by the posterior columns, and the integrity of these latter, especially in the earlier stages of the disease, would account for its retention in some cases."

ETIOLOGY.

Sex.—Males are far more liable to syringomyelia than females. Out of one hundred and ninety cases, one hundred and thirty-three were in males and fifty-seven in females, or seventy per cent. and thirty per cent. respectively. The explanation of this is no doubt the influence of trauma in developing an innate tendency to the disease, or in producing directly pathological conditions in the spinal cord, which are followed by glioma and cavity formation.

Age.—The influence of age is probably active in great measure, as per-

mitting occupations and exposure to accident, etc., which act directly. The following table shows the frequency in the different decades of life as collected by Schlesinger:

Age.	Male.	Female.	Total.
1 to 10	4	1	5
11 to 20	36	8	44
21 to 30	53	25	78
31 to 40	30	12	42
41 to 50	4	7	11
51 to 60	3	3	6
61 +	3	1	4
	133	57	190

The decade in which the disease is most frequently observed is that of twenty-one to thirty years. There is a tendency to a somewhat later development of the disease in women than in men. One case of Schlesinger's (Obs. xvi.) occurred in a woman aged seventy-eight years.

Occupation.—The vast majority of cases occur in those who live by manual labor. Overwork is frequently noted.

Trauma.—A large number of cases are apparently the result of injury, particularly to the back. We may mention particularly cases of Oppenheim, Strümpell, Sinkler, Stadelman, Minor, Sokoloff, Silcock, Harcken, Bikeles, Alexis Thomson, and Eskridge.

It may be said in this connection that Eickhorst found in experiments on animals in which the cord had been divided or injured that cavities formed frequently in the posterior columns, and sometimes extended into the central canal.

In cases in which the syndrome in syringomyelia becomes suddenly present, especially when we have a history of a recent trauma, we may naturally suspect the existence of hæmatomyelia, since hemorrhages of the spinal cord principally affect the central portion,—*i.e.*, the gray substance.

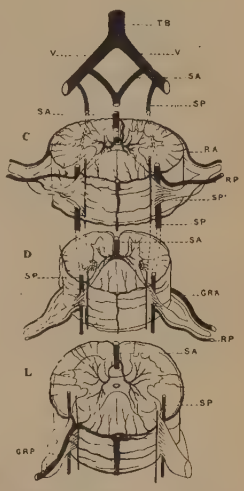
The production of glioma in consequence of trauma requires a considerably longer time. It is quite likely that traumatic hemorrhages of the medulla may evolve hemorrhagic cysts, which would then have compact surrounding capsules of connective tissue, and might form the starting-point for central gliomatous degeneration. Such a pathogenic process may also occur when the central hemorrhage is not induced by trauma. In four cases, in which the organic lesion of the spinal cord undoubtedly resulted from trauma, Minor found many symptoms closely resembling those occurring in syringomyelia: for instance, the characteristic dissociation of sensibility. As the patients in question are still living, the diagnosis has not been confirmed. In a fifth case of traumatic hæmatomyelia death occurred after several days. The autopsy revealed a tubular hemorrhage throughout the entire gray axis of the spinal column.[1]

[1] Archiv für Psychiatrie, vol. xxiv.

The accompanying figure shows the arterial circulation, for the cervical (*C*), dorsal (*D*), and lumbar (*L*) regions of the cord.

How far excess in alcohol and exposure to cold and dampness are factors in the production of the disease we cannot say. These influences are probably of small moment. It has been noted by Verhoogen and Vandervelden.

Fig. 25.



Arterial circulation in the spinal cord. (Brissaud.)

Infectious Diseases.—These have a distinct predisposing influence. The following diseases have been observed in the previous history of subjects of syringomyelia:

Syphilis (cases of Simon, Schuele, Neuhaus (Obs. i. and v.), Tornow); rheumatism, arthritis deformans (Klemm); typhoid fever (Bruhl, Bernhardt, Freund, Westphal, Schüppel, Sokoloff, Schultze, Remak); tetanus (Knoppek and Meyer); variola; erysipelas of the head; chronic chorea (Duchenne and Hoffmann); Basedow's disease (Joffroy and Achard); pachymeningitis chronica (Rosenblath, Schmaus, Francotte); myelitis (Leyden); anterior poliomyelitis (Kahler and Pick); Friedreich's disease (Friedreich and Dejerine, Letulle).

Heredity.—In two instances syringomyelia seems to have assumed a family type. Verhoogen and Vandervelden report the disease occurring in two sisters and a brother. In an autopsy on one of these cases the anterior and posterior horns were found intact; the central canal, of an oval form with the long exis transverse, was found with its aperture closed and the cavity full of granular exudate and cells with gray nuclei and with cellular *débris*. In the mid-dorsal region there was sclerosis of the external part of the lateral column and of the columns of Burdach and Goll. The canal was the same as in the cervical enlargement. In the lumbar region there was sclerosis of the postero-internal part of the anterior column, and in the whole extent of the lateral column and the anterior portion of the column of Burdach alteration of the canal, most marked in the upper portion.

Dr. Andrea Ferrannini has recently described four cases in one family, including two brothers, Nicola and Francesca, their sister Marta and mother Benedetta. At different times all four have sought medical advice for the same affection. Panaris, paræsthesia, and special forms of dysæsthesia, limited to a single upper extremity or abscess, developed without any apparent cause; felons developed in the left thumb of the two brothers, in the right thumb in the mother, and in the right index-finger of the sister Marta. In Nicola, Benedetta, and Marta the swelling was followed by necrosis and complete destruction of the last phalanx in each case. In the

fourth patient there was no necrosis. In all four patients the incision of the swelling by the physician at different times gave exit to a very small quantity of pus or sometimes only to blood. Marta felt neither the incision nor the extraction of the dead bone, much to the wonderment of onlookers. These manifestations occurred in two of the cases, Nicola and Marta, between the thirtieth and thirty-fifth years, and in the others at about the fiftieth year.

Panaritia were observed in all four patients, and the ulceration with acute œdema or pseudophlegmon of the forearm were noted in Nicola. There were marked vasomotor changes. Appearance of erythromelalgia in Francesca's left hand. These appearances would subside at times and the hand would suddenly become white and cold as though dead, then painful at times, constituting an acrodynia and an acroparæsthesia, hyperæsthetic rather than anæsthetic. Disordered sensation to temperature. Heat was recognized as cold and *vice versa*. Formication in the calves of the legs, ankles, sole of the foot or shoulder, chiefly on the left side of the body. Burning, or a sense of cold, in the first three fingers of the left hand or in only one, particularly the ungual phalanx of the thumb. Frequently at times a painful sensation as from many pins pricking, or stings of bees. Also a curious sensation in the ball of the thumb. These sensations precede an attack of erythromelalgia. The sensations were likened to the action of a file or the gnawing of an animal; the pain was deep and either intermittent or intensifying towards a crisis. The pains were like those of syphilis except that there was no nocturnal exacerbation and no increased pain on pressure.

A little ice in contact with the thumb gave the sensation of intense heat; a temperature of 5° C. was felt as hot; at other points of the body gave the sensation of contact only. On the other hand, there was complete loss of heat sense, even when tested to 100° C.

Fibrillary twitchings present.

Varieties.—The great diversity of forms of syringomyelia renders a classification desirable. We may have types as follows:

1. Atrophic or anteropoliomyelitic.
2. Spastic and amyotrophic lateral sclerosis.
3. Sensory (posterior and median poliomyelitic).
4. Type Morvan.
5. Lumbar type.
6. Unilateral type.
7. Bulbar type.
8. Anterior leucomyelitic or posterior leucomyelitic.
9. Latent form.
10. Non-typical cases.

Clinically, we may say that there is a gliomatous form beginning early, —between the ages of fifteen and twenty-five. At quite an early period cicatrices from painless burns are found, marking the early appearance of

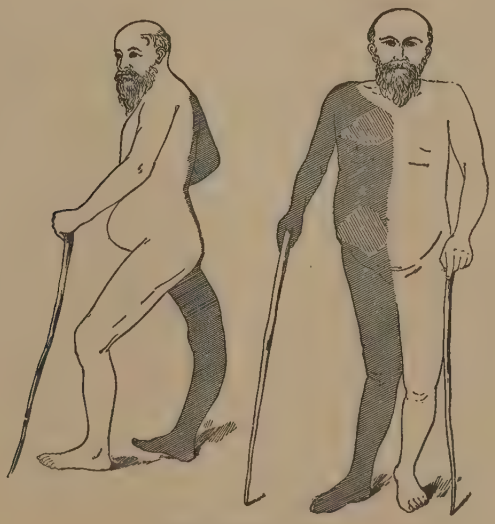
thermo-anæsthesia. In other cases amyotrophy is one of the earlier signs. The early stage is long, but steadily progresses.

In the myelitic form the onset is later in life; it has less tendency to progress, and may remain completely stationary. For example, in a case of Charcot's, the early symptoms, appearing at the age of forty years, assumed a paraplegic form, with cervical location, with amyotrophy, and with sensory and trophic disorders. These developed rapidly at first, and then remained stationary.

Type Morvan.—Morvan and Dejerine still claim for this affection a distinct identity, but most authorities classify it as a type only of syringomyelia. An argument for its identity is found in the apparent tendency of the disease to occur frequently in certain localities. This has been taken to indicate a toxic origin.

Gombault's case, in which he found in a patient with Morvan's disease a peripheral neuritis with slight sclerosis of the cervical cord, lends some probability to this theory; but it has lately been shown that peripheral neuritis may occur in syringomyelia as well as Morvan's disease, and that cavities in the spinal cord may occur in well-marked cases of the latter affection.[1] (Joffroy and Achard.) Thus Morvan's disease is held to be only a special clinical form of syringomyelia characterized by predominance of panaris.

FIG. 26.



Unilateral gliomatosis.

Unilateral Gliomatosis.—It is not unusual for the gliomatosis to be confined to the entire gray matter, or to a single half of the spinal cord. Such irregularities naturally give rise to difficulty of diagnosis. (See Fig. 26.)

[1] Soc. Méd. des Hôpitaux, 1890 and 1891.

(The author is indebted to Dr. Charles K. Mills for the use of this figure, taken from his work on "Nervous Diseases," in press.)

(Cases of Oppenheim, Rossolimo, and of Dejerine and Sottas and Weintraud are of this variety.)

The bulbar type has already been considered.

Tabetic Type.—This type arises from a combination of tabes with syringomyelia, or by an extension of the gliosis to the posterior columns. Such cases are not unusual, and have been recorded, among others, by Redlich, Eisenlohr, Nonne, Senator, Mann, Rosenblath, Jegorow, Schüppel, Schlesinger (Obs. xii.).

In a recently published case of Oppenheim's (*Archiv für Psychiatrie*, vol. xxv.) a man, aged forty, had for a long time an affection characterized for the most part with signs of tabes (unsteadiness of gait, and, with eyes closed, increased sway). The knee-jerk was absent on the left side. There were troubles of sensation, with dissociation of tactile sensibility and thermic and pain sense, and scars on different portions of the skin. The subject, who had kypho-scoliosis, was weak-minded, and had ideas of grandeur, etc. Dementia paralytica. Death ensued, and at the autopsy diffused glioma of the spinal cord and gray degeneration of the posterior columns were found. Chronic cerebral pachy- and leptomeningitis were found, dilatation of the ventricles, atrophy, and gray degeneration of the nerves and optic fibres (bandelettes). Central gliomatosis of the cord and posterior fascicular degeneration.

Glioma of the lower cervical enlargement extending through the dorsal cord to the lumbar enlargement.

In the mid-dorsal region the entire gray substance was involved. In the lower part and in the lumbar region the gliomatous product was confined to the left half of the cord.

(To be concluded.)

PREPARATION OF FROZEN SECTIONS BY MEANS OF METHYL AND ETHYL CHLORIDE.[1]

BY HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania.

In September, 1895, while watching Dr. John B. Deaver perform a minor surgical operation with ethyl chloride, the thought occurred to me that this reagent might profitably be employed in preparing frozen sections

[1] Preliminary report. Method demonstrated and sections exhibited at the meeting of the Philadelphia Pathological Society held December 10, 1896.

for histological purposes. The results thus far obtained have been exceedingly satisfactory, and, while the method is somewhat expensive, no accessory apparatus is required for the microtome.

Hamilton's method of preparing the tissues for freezing gives good results ("Text-Book of Pathology," by D. J. Hamilton, vol. i. page 58). Another way of getting the tissue ready is that recently advised by J. Orth (*Berlin. klin. Woch.*, No. 13, 1896),—one hundred parts of Müller's fluid are mixed, when wanted, with ten parts of formol. Small pieces of the tissue under examination are fixed and hardened in this solution in the incubator for three hours. At the end of this time they are removed and thoroughly washed, and alcohol is gradually added until they are placed in ninety-five per cent. alcohol. This latter reagent must, of course, be removed before the tissue is frozen. If desired, after washing, the specimen may be at once transferred to the solution of acacia and sugar and frozen. Or, as suggested by H. Plenge (*Virchow's Archiv*, vol. cxliv. page 409), the pieces may be placed in a four-per-cent. formaldehyde solution for a quarter of an hour, and then frozen in the same solution.

When the tissue has been prepared in some such manner, or even when perfectly fresh, it is placed with some formol and gum acacia fluid upon the specimen-holder of the microtome, and a small stream of ethyl chloride, methyl chloride, or anestile (a mixture of these two reagents) is played from above directly upon the specimen. The tube containing the ethyl chloride is held about a foot from the specimen, and moved from place to place until the specimen is firmly attached to its base of support, and the upper portion is coated with a few crystals of ice. These crystals are extremely small and delicate, and, therefore, do not injure the tissue so markedly as in some other of the freezing methods. The specimen is readily frozen in from thirty seconds to a minute. Sections are then cut and placed in water or fifty-per-cent. alcohol, and mounted in the usual way. Excellent stained preparations may be prepared in fifteen minutes or less from the time that the tissue is removed from the body.

A fuller report, with photomicrographs of tissues prepared by this method, will be presented in a later communication.

CLINICAL LECTURES.

CONSIDERATIONS ON THE RELATIONSHIP BETWEEN THE VEINS OF THE HEAD AND NECK AND THE PATHOLOGY OF THE PARTS.

A LECTURE DELIVERED AT TUFTS COLLEGE MEDICAL SCHOOL ON OCTOBER 28, 1896.

BY CHARLES GREENE CUMSTON, B.M.S., M.D.,

Assistant Professor of Surgical Pathology, Faculty of Medicine, Tufts College, Boston, etc.

GENTLEMEN,—Wounds of the head and neck and contusions of the face and integuments of the cranium differ in no way from those found in other parts of the body. They are accompanied, perhaps, more than elsewhere by considerable hemorrhage on account of the large number of veins which cover the head.

Thus we find that contusions of the head form more or less large tumors, which contain blood and are known under the name of sanguineous bosses. But the most interesting part of the question relates to the complications which follow, such as erysipelas, abscess, and diffuse phlegmon.

The head is a region of predilection for erysipelas. The various traumatisms, with solution of continuity of the soft parts, and the fact of the wounds being exposed to the influence of the pathogenic agents of the exterior, are eminently favorable causes for the evolution of this affection. The face is remarkably predisposed to erysipelas, and is more often the seat of this disease than the scalp. In fact, it is not rare to see an erysipelas of the scalp the result of the extension of the affection from the face, and it is even the most common way of progression.

When limited to the face, erysipelas is not a serious disease; in some cases, however, it has ended in death of the patient. But these cases are rare, and it may be said that the malady only becomes serious when it invades the scalp. When this occurs a very intense delirium takes place, seeming to indicate that the disease has invaded the brain and its envelopes.

Now, how can we explain this extension of the erysipelatous inflammation? If you will recollect the various vascular communications existing between the interior and the exterior of the cranium by intermediary of the diploic canals, this question is quickly settled. The inflammation, which is first limited to the face, reaches the venous branches of the scalp, and this phlebitis is propagated through the numerous vessels of the diploë, and

thus it extends over a considerable surface of the brain and meninges. It has been said that this extension could take place by the vessels of the orbit. If this is possible, it appears at least more difficult. Now, erysipelas of the orbit is simply a facial erysipelas, and it is just these cases which are limited to the face that rarely produce death and do not cause cerebral complications.

By the same fact abscess and diffused phlegmon of the head following traumatism or an erysipelas may be the cause of a meningo-encephalitis by causing phlebitis of the veins of the diploë. Let me add, also, the extension of phlegmon to the subperiosteal layers of the bones, and from there continuing to the bone itself; thus they may become the starting-point of a pyæmia and purulent infection.

An ordinary boil on the face or a scratch on the nose is sufficient to start up an erysipelas of the face, especially if the subject is in a locality in which the disease is present, and this erysipelas may in its turn give rise to a phlebitis of the facial vein, which extends to the ophthalmic vein, and becomes the starting-point of a thrombus of the cavernous sinus, or of a meningo-encephalitis, finally resulting in death. We still find in the practice of surgery cases of this description.

Now, what practical conclusions can we draw from what I have said? The first is that every wound of the head, no matter how small, should be treated with the greatest care, in order to avoid the unfortunate complications to which it may give rise. After having arrested the hemorrhage by compression over the wound, the latter should be washed thoroughly with an antiseptic solution in order to remove all foreign substance which it may contain; and every time that it is possible we will endeavor to secure union by first intention and afterwards apply an occlusive dressing. J. L. Petit has mentioned as a cause of erysipelatous inflammation of the wound and its neighborhood, the introduction of hair into the solution of continuity; in wounds of the integuments of the cranium it is consequently decidedly indicated to shave the hair to a large extent around the wound.

There is a special variety of wounds of the integuments of the cranium which, nevertheless, belongs to contused wounds; this is the lesion resulting from projectiles of war. The border of wounds produced by fire-arms should be shaven as in any other case, the contusion of the tissues being always very severe, and thus in the greater number of cases the formation of an eschar, which will be eliminated, will occur; and in these cases reunion by first intention should not be tried; you will simply cover them with an antiseptic compress, which should be frequently changed in order to prevent infection.

If in spite of all these precautions erysipelas invades the wound, you should immediately commence a constant local spray of a solution of carbolic acid, and an internal administration of antiseptics, such as bismuth tribromophenolicum, salol, or naphtol. Incisions should be made in those parts which appear to be softened, although the pus may not have com-

pletely formed and collected; and when the treatment employed has not prevented suppuration from occurring you should open freely all the foci in order to give free issue to the liquid and thus prevent its stagnation and absorption into the economy.

I will now consider the wounds of the neck. The veins of the anterior group, which comprise the internal jugular vein and the anterior and posterior jugular vein, being only slightly protected by the soft parts, especially at their point of termination, are more easily accessible to vulnerating agents than those of the posterior group, which is made up of the posterior jugular and vertebral veins. On the other hand, being of considerable size, the gravity of wounds of the anterior group will be considerable on account of the enormous hemorrhage which may result. Being strongly united to the aponeuroses, which hold them gaping open, and being also more under the influence of thoracic aspiration than any other veins of the body, on account of being so near the heart, they may, when opened, easily allow the entrance of air; but the great richness of anastomoses which united them at their origins may explain why the surgeon can ligate a large venous trunk without fear of interrupting the circulation.

Traumatic lesions of the veins of the neck are not infrequent, and the most varied kinds of traumatism may produce them. Thus they may occur in cases of cuts from a knife, sword, or even lancet. You all know that bleeding from the external jugular vein was very frequent when bleeding was a common therapeutical agent. It is in these various cases that are observed clean, complete, or incomplete sections of the veins. Those of the internal jugular vein are to be particularly feared. Bullets and comminutive fractures of the lower jaw may determine very serious lesions of the veins of the neck. Stromeyer reports a case in which there was ulceration of the internal jugular vein, produced by a piece of the lower jaw carried against it by a bullet. Poeckels and Fischer have reported a case of perforation of the jugular vein produced by a ball which became lodged near the gullet. Gross has observed a case in which a bullet, after having perforated one wall of the internal jugular vein, became lodged and encysted in the internal wall on the opposite side of the vessel.

Wounds of the neck are quite frequently met with during operations performed in this region of the body, such as tenotomy, etc., in cases of extirpation of certain cervical tumors necessitating, by severe traction on the surrounding parts, ligature of the arteries, especially during the efforts of the surgeon to denude the vessel and to separate it from the veins by which it is surrounded. Couty mentions a case of wound of the anterior jugular vein when a seton was passed; there was introduction of air into the vein. Nicaise mentions two cases of tear of one of the collateral veins of the internal jugular during enucleation of a tumor, which necessitated ligature of this large vessel on account of the extreme hemorrhage which resulted. And, lastly, let me remind you of the frequency of wounds of the inferior thyroid veins during the operation of tracheotomy.

All such lesions should be considered serious, but the gravity is in direct relation to the intensity of the traumatism, as well as to the extent of the lesion itself. In slight contusions a thrombus usually forms which sometimes becomes organized, thus definitely obliterating the vein; at other times it becomes absorbed and the vessel again becomes patent.

In incomplete sections of the veins, in contused wounds by fire-arms, the rapidity with which the clot forms assures a primary hæmostasis; the inflammatory process produced by the endophlebitis and periphlebitis rapidly ends in the formation of a cicatrix. Extensive denudations get well very easily when no inflammatory reaction occurs around the veins.

Such, gentlemen, are the phenomena which take place when the wounds are aseptic. But this is not the case when the wound is immediately infected by a septic body, or, secondarily, after necrosis of the walls or by want of proper care. The wound of the vein may then end in the most serious complications, such as extensive suppurating phlebitis, thrombosis, and embolus, purulent infection, pyæmia, and secondary hemorrhage.

Langenbeck has pointed out that wounds by gunshot especially, by the resulting singeing of the soft parts surrounding the vein, as well as the vein itself, may set up an inflammatory process which causes the clots to soften and break down, by which process they are detached from the walls of the vessel and produce secondary accidents. Among these ulterior complications I would mention hemorrhage, thrombosis, phlebitis, and pyæmia.

I would also mention that arterio-venous aneurism of the neck has often, in fact usually, a traumatic lesion of the internal jugular vein as a cause.

Let us now see what takes place when the traumatism is more violent, opening the jugular vein. Two principal and immediate symptoms occur; these are hemorrhage and entrance of air into the circulation.

The hemorrhage is generally of little importance when it takes place from a secondary vein. It consists in an oozing, and is easily arrested by a well-applied compression. If there is rupture of the large venous trunk and if the wound is narrow, the blood spurts out in a jet for a minute and then dribbles away. If it collects in the meshes of the cellular tissue it forms a venous tumor, which is known under the name of diffuse venous aneurism.

Primary hæmostasis is obtained in these cases by the formation of a clot or by a foreign body obliterating the vein. In contused wounds by fire-arms hæmostasis occurs rapidly on account of the ease with which the clot forms, owing to the irregular and ragged borders of the wound. Now, if the venous wound communicates freely with the atmosphere, hemorrhage is always abundant, sometimes to such an extent that death takes place. Primary hæmostasis with formation of the clot is in these cases very difficult if not impossible. Forcipressure should first be resorted to, and after the vessel is well secured it should be ligated.

Dussautour has demonstrated the efficaciousness and innocuity in cases

in which ligature has been performed, and it may be said that neither œdema nor cerebral accidents are to be feared, provided the carotid artery is not comprised in the ligature when the vein is tied. Thrombosis and phlebitis, which so frequently follow denudation of large vessels, are no longer to be feared.

Now, should we apply a lateral ligature in cases in which there is incomplete division of one of the veins of the neck? In reply to this I would say that on account of the great number of fatal results which have occurred when lateral ligation of a venous trunk has been performed it should be rejected, and that the proper practice is to immediately apply a circular ligature to the vessel. However, within the last few years Pilcher, of Brooklyn, has reported a few cases of cure after lateral ligature of the veins. From what this authority says, it would appear that lateral ligature should be employed for the external and anterior jugular veins, in which it is nearly always successful, and in a general way it should be applied for all incomplete wounds in all cases in which the gravity of the hemorrhage does not necessitate a circular ligature.

Now, gentlemen, no matter what kind of ligature you may attempt, your catgut or silk must be absolutely aseptic, in order to avoid fatal septic complications. Let me say that a circular ligature should always be placed on both ends of a cut vein, because on account of the absence of valves and the thoracic aspiration the blood may flow out from the lower end and air enter into the vessel.

Another very serious complication is the introduction of air into the circulation. When this accident occurs a whistling, gurgling sound is heard, caused also by a syncopal condition of the patient. In some cases a spumous blood has been noticed to come out from the wound of the vessel during extirpation.

The cases are many in which air has entered the circulation after small or medium-sized wounds of the veins, but it is to be particularly feared when the wound is large. Couty has reported a large number of cases relating especially to wounds of the internal jugular, external jugular, and anterior jugular veins, during extirpation of tumors in the neck.

He reports nine cases of introduction of air by the external jugular, five cases by the internal jugular, and two cases by the anterior jugular vein. No matter how terrible this accident may be it does not always cause death, because we have many cases on record, in which this accident has occurred during extirpation of growths in the neck, in which death did not take place. Very recently an accident of this kind occurred at Lyons during the removal of the axillary glands; the subclavian vein being opened air entered, and death was immediate.

If this unfortunate accident should occur during an operation, the first thing to do is to compress the gaping vessel with the finger; then bring the patient back to life by practising artificial respiration and all other resources employed for syncope and asphyxia. From what I have said you will

see what precautions must be taken in cases of wounds of the veins of the neck, both immediately following the accident and during the convalescence.

I now come to the consideration of traumatic and operative wounds of the cranium. The vital lesions of traumatic or spontaneous origin may also have a very serious effect on the brain and its covering, such as suppurating osteo-periostitis, caries, and necrosis, and these by being complicated with phlebitis of the canals of the diploë may transmit the inflammation to the sinuses and to the brain itself. Caries of the mastoid cells following suppurating inflammation of the mucous membrane of the middle ear, which may extend into the lateral sinus, is frequently met with, while meningo-encephalitis, pyæmia, and purulent infection are the sad consequences.

Independently of these lesions which interest the venous apparatus in an indirect way, we should study the influence of severe traumatism of the cranium, which is generally accompanied by complications for which the venous system of the cranium is immediately responsible.

Wounds of the sinus which communicate with the exterior are the most serious, and this accident (which is very infrequent) may be followed by the introduction of air into the veins; death is usually the consequence. Generally, the vessels may be hit by the vulnerating body itself, such as a ball or the blade of a cutting instrument, or by the sharp projection of a bit of bone. Pott and Hueter both report cases of perforation of the superior longitudinal sinus by a splinter of bone.

At other times the vessels may be ruptured by the shock given to the entire brain, or burst open by the tearing off of the dura mater. Hemorrhage and collection of blood are the results of these vascular lesions.

The venous blood which flows away after wounds of the cranium comes from various sources. It may be furnished by the vessels of the diploë and by the vascular prolongations which exist at the surface of the dura mater, by the different sinuses, and by the veins which surround and traverse the brain. The most important vessels and those which are the most often the seat of injury are the superior longitudinal sinus, the coronary sinus, and the cavernous and transversal sinuses. Another source of venous hemorrhage is that coming from the anterior median meningeal vein, which is frequently ruptured; its size and the fragility of its walls perhaps expose it more to traumatism than its artery. According to the form of the wounds the blood flows either inside or outside of the cranium; the hemorrhage alone may be sufficient to cause death, but this is not frequent. The only really serious hemorrhages are those due to a deep wound of an important sinus.

When the blood collects in the interior of the cranium it forms an intracranial collection. It is usually found between the dura mater and the walls of the skull. Sometimes it is found between the meninges in the cavity of the arachnoid around the pia mater. At other times it occurs

in the midst of the cerebral substance and in the ventricles. It occurs at the point struck or, on the contrary, in a point diametrically opposite, or at a distance more or less considerable from the point of traumatism. When intracranial hemorrhage occurs it produces accidents of sudden cerebral compression; this compression may cover a considerable extent of surface, which is the most favorable condition of affairs for the patient; or it may occur on a more or less limited surface of the brain, in which case the effects are far more dangerous.

In the majority of cases these collections of blood will become absorbed after a time. But you should never lose sight of the fact that later on they may be the point of an inflammatory process which ultimately results in a meningo-encephalitis. They may be invaded by an inflammation followed by suppuration, the latter resulting in pyæmia or purulent infection. This production of pus may occur very rapidly or very slowly.

I will now consider the diseases of the skin and subcutaneous cellular tissue of the head and neck in their relationship to the venous system.

Besides erysipelas, of which I have already spoken in the beginning of this lecture, boils and carbuncles are often met with on the head or neck. Although they appear to be entirely innocent, they have a very rich vascular supply from these regions, a character which is particularly serious. In fact, gentlemen, cases of death following a simple boil on the lip or on the eyelid are relatively frequent occurrences, and when an autopsy is made in subjects dying from this slight affection, the constant presence of a phlebitis has always been noticed; the inflammation invades the facial vein, and is propagated by the ophthalmic vein to the sinus of the dura mater, thus causing purulent infection and a mortal meningitis.

Carbuncle of the neck, although not so dangerous as when occurring on the face, may also become complicated by phlebitis of the veins of the vertebral column or the cranial sinuses. Broca has seen a carbuncle open directly into the vertebral canal; in another very curious case he found the occipital protuberance completely denuded, and at the autopsy he was able to demonstrate that the phlebitis extended by means of the diploë to one of the sinuses of the dura mater; the patient died with symptoms of purulent infection.

It is on account of the gravity of these affections that speedy elimination of the mortified tissues is generally recommended. This is done by incisions with the knife, thermo-cautery, or the free use of the sharp spoon.

Inflammation of the subcutaneous cellular tissue, such as abscess and diffused phlegmon that are met with on the head, may be followed by the same complications that are met with in erysipelas. Inflammation of one of the numerous plexuses which are found at the base of the cranium may also be the starting-point of a phlebitis of a sinus.

A very interesting case is reported by Labalette of a patient who, during a suppurating inflammation of the right tonsil, had an exorbitis on the same side. The day following his entrance to the hospital the left eye

was also in a state of inflammation; the general condition became rapidly worse, and death occurred on the fourth day, in the midst of symptoms of suppurating phlebitis of the ophthalmic veins and the cavernous sinuses. This diagnosis was fully confirmed by the autopsy.

The development of purulent collections in the neck near the large venous trunks often produces very dangerous accidents. Besides phlebitis, thrombus, embolus, and purulent infection, I would mention hemorrhage and ulceration with perforation. Severe hemorrhage has been known to occur after opening a suppurating gland in the neck either in children, principally at the time of convalescence from the eruptive fevers, or in adults. The blood appears a few days or even some weeks after the invasion of the purulent collection, and has evidently as a cause a change in the walls of the vessel. Out of thirty-eight cases of ulcerative abscess in this region collected by Gross, twelve involved the internal jugular vein; only one the external jugular vein. Death was the result of this complication, and occurred usually after a certain number of hemorrhages had taken place: in only three cases was death sudden in its appearance.

A case of diffused phlegmon in which the pus invaded the anterior mediastinum, producing a phlebitis of the internal jugular vein, has been reported by Trelat. Perier has observed a case of abscess of the glands of the neck terminating fatally by ulceration of the jugular vein and consecutive hemorrhage; it was a child of three years in which an abscess of the neck had very rapidly developed. An incision only through the skin made with the greatest care gave issue to pus, followed immediately by a considerable amount of venous blood; this hemorrhage was stopped by compression of the wound, but recurred during the three following days, and on the fourth it was accompanied by an attack of suffocation, and the patient died. The autopsy showed that the internal jugular vein was ulcerated to the extent of about three centimetres.

Phlebitis of the large veins is generally accompanied by cerebral symptoms due to the coagulation of blood which occurs in the sinuses. These coagulations are not always due to inflammation; they may be simply the result of the arrest of blood in the vessels on account of the compression exercised on them by purulent collections in the deep parts of the neck.

Now, gentlemen, when you find yourselves in the presence of an abscess of the neck, being aware of the dangers that may occur from lesions of the venous trunks, you should operate early; early incision is the proper conduct in the surgery of to-day. In abscess of the neck following fever Spender even advises an incision before suppuration is well established, because if the collection is opened later on there is in his opinion great danger in the operation.

We now come to the consideration of the relationship of the sinuses and the veins of the head and neck to certain neoplasms and operations. Certain vascular tumors are met with more frequently on the head and neck than in any part of the body. This relative frequency is very probably due to the

great vascular richness of the parts. You all know that nævi, angioma, and erectile venous tumors are found not infrequently on the face or neck. Numerous are the cases of arterio-venous aneurisms of the carotid and temporal regions; one of the forms of goitre is also characterized by the development of arteries and venous plexuses in the thyroid gland, thus producing a hypertrophy of the organ.

Arterio-venous aneurisms of the orbit are far from infrequent, and many such cases have been reported at the Ophthalmological Society of Great Britain. Two remarkable cases have been reported by Nélaton. The first case died from repeated and profuse epistaxis; the second died after ligature of the primary carotid artery. Lee reports a case of this kind; the jugular vein was very much dilated and burst, causing a severe hemorrhage and afterwards loss of sight.

Delens in 1870 collected thirty-three cases of ligature of the primary carotid artery for pulsatile vascular tumors of the orbit, and found the mortality to be fifteen per cent. I would point out that these vascular tumors, whether arterial or venous, are far from being arterio-venous aneurisms or varicose dilatations of the ophthalmic vein and its branches in every case.

The vault of the cranium is also the seat of certain sanguineous tumors; some have no communication with the interior of the cranium, and are subcutaneous, subaponeurotic, or subpericranial; others are filled with venous blood and communicate with the intracranial circulation by means of an emissary vein of the cranium or by the diploic canals. This last variety of tumor is always connected with a traumatic or spontaneous perforation of the bone. The influence of traumatism on their development can no longer be denied since the cases of Hutin and Pott, in which there was a wound of a superior longitudinal sinus which was perforated by a splinter of bone, and thus put in communication with an extracranial tumor. Hutin found this lesion at the autopsy of his patient. Pott cured his patient by means of an operation which was performed on account of an error of diagnosis; he applied the trephine three times before he could extract the fragment which had cut through the sinus where it had remained implanted.

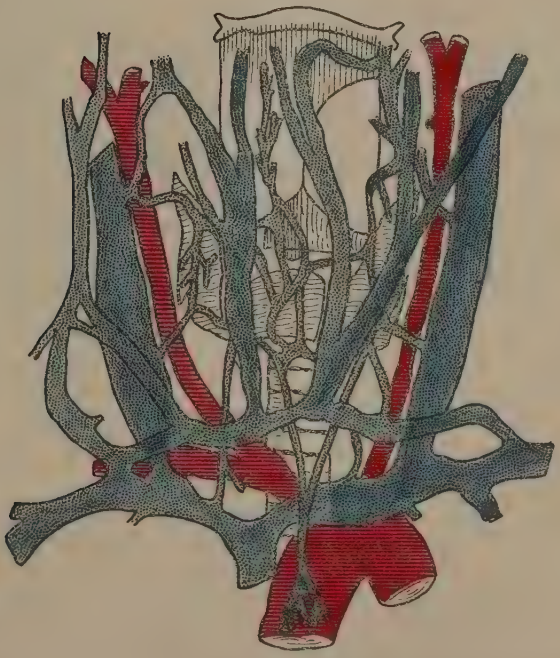
I have already pointed out to you the unhappy consequences which may result from a wound of a sinus or of a vein, and it is for this reason that in trephining you should always be careful not to open into a sinus, although occasionally this accident may occur when operating on a case of mastoiditis; but by quickly packing the wound and postponing the rest of the operation for a few days patients recover without further trouble.

You can avoid opening the superior longitudinal sinus by trephining from fifteen to twenty millimetres from the sagittal line; the lateral sinus, being seated on the tract of the lateral glabello-iniac line, at its posterior third, may be surely avoided if you desire to reach the cerebellum by placing the trephine twelve or fifteen millimetres below this line. In order to avoid the lateral sinus in trephining the mastoid apophysis it is necessary to open the apophysis at its anterior half at the level of the meatus.

Fig. 1.

The sinuses of the dura mater, and veins of the neck and face.

Fig 2.



Veins of the neck. (Drawings from a dissection by H. Gaudier. The veins are dotted, the aorta and its branches cross-lined.)

Incision of an abscess or phlegmon when seated in the neck should be performed as little as possible, but when this becomes necessary I would advise you to use the thermo-cautery instead of the knife, because the former is less dangerous.

In tracheotomy lesions of the inferior thyroid veins are never the cause of serious accident. One case, however, of death from this cause has been reported I believe by an English writer. The hemorrhage which results immediately after opening them is sometimes alarming, and if it does not stop as soon as the respiration of the patient begins to take place, you should resort immediately to ligation of the cut extremities. It was to avoid these accidents that Verneuil resorted to the incision of the soft part with the thermo-cautery.

The complications which sometimes occur in extirpation of tumors of the neck, such as cysts, lipomata, and fibro-sarcomata, are so grave, and tumors of the glands, particularly deep-seated tumors, are certainly all so difficult to remove, that the operation should be well planned and considered before being attempted. Very often it is well to desist from operating unless the deformity produced by the growth is very pronounced, or the patient firmly desires an operation, or especially if the tumor by its position, size, and rapid growth is the immediate cause of compression of the deep organs of the neck.

And, lastly, let me say that in order to be prepared for the dangerous complications of hemorrhage and entrance of air into the veins, you should always take the greatest precaution during the operation; go slowly, and ligate your veins successively between two ligatures, and afterwards cut them when both ends are strongly sealed together by your silk. By operating in this manner you will avoid denuding the large veins which can give rise to an extensive and progressive thrombosis.

I have now done with the subject of to-day's lecture, and in closing I would request that you carefully examine the two accompanying drawings of the veins of the neck and head, which will render my lecture more clear to you.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,
Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

J. A. SCOTT, A.M., M.D., AND JOSEPH SAILER, M.D.,
Physician to the Out-Patient Department of the Pennsylvania Hospital, Associate in the Pepper Clinical Laboratory.

Pyocyanic Disease in Human Pathology. (*Comptes Rendus de la Société de Biologie*, July 17, 1896.) By M. Charrin, M.D.

An extraordinary case has been observed by Dr. Bardon, in which a issue woman of forty-five years could voluntarily cause a greenish liquid to from her breasts. The patient was neurotic, and had suffered for many years from dyspepsia, but had never had fever or other symptoms of acute disease. Certain areas of peculiar pigmentation upon the skin suggested a generalization of the pigmentary process. Cultures finally determined the presence of the bacillus pyocyaneus in the liquid from the breasts.

A Symptom of Fæcal Tumors. (*Wiener klinische Wochenschrift*, October 1, 1896.) By R. Gersuny, M.D.

The symptom consists of a peculiar sensation of sticky separation that is imparted to the finger when it is pressed firmly into the tumor and then slowly relaxed. The conditions essential to the production of this symptom are a certain degree of dryness of the intestinal mucous membrane, and a certain amount of impressionability on the part of the mass of fæces; thus, if the latter be too hard, it may not be possible to elicit the symptom until an oil clysma has been administered. Finally, there must be enough gas in the intestine to force the wall away from the surface of the tumor as the pressure is generally relaxed. The symptom indicates, therefore, that a somewhat doughy mass, together with gas, is enclosed in a smooth-walled sac. Gersuny names it the "Klebe symptom," which may be freely translated as the "adhesion symptom." To test its presence, the finger is placed over a prominent portion of the tumor, and pressed slowly and deeply into it; then the pressure is gradually diminished, and the finger very slowly raised, when the separation, as of two sticky surfaces, is very easily distinguished.

The case that led to the discovery of this symptom is sufficiently inter-

esting to deserve a brief note. The woman had suffered from obstinate constipation from infancy; at various deliveries a firm pelvic tumor had been noticed that interfered with parturition. A diagnosis was made of neoplasm of the adnexa, and operation advised. When the abdomen was opened, the Sigma Romanum and descending colon were found to be greatly distended, and in the lower part of the former there was an enormous mass of fæces. The wound was therefore closed. From this time Gersuny's symptom was very evident upon every attempt at palpation until, after oil clysmata with massage, the tumor was finally expelled. Two other cases were also observed, in both of which Gersuny's symptom and hypertrophy of the colon were present, and the interesting question is raised as to whether the coprostasis or the hypertrophy of the colon is the primary affection. All treatment excepting injections of oil with massage has so far been useless.

A Case of Ulcerative Endocarditis treated with Antistreptococci-serum; Recovery. (*Lancet*, October 17, 1897.) By Dr. Sainsbury.

The patient was a lad of thirteen years, who had been sick for more than two weeks, complaining of pain in the chest, and suffering from delirium and some fever. Upon admission the area of cardiac dulness was found to be enlarged, and there were a thrill and double murmur at the apex. The breath-sounds were weak and there was crepitation in both lungs. Four days after admission a symmetrical erythematous rash appeared on the buttock and spread to the rest of the body; and five days later streptococci were found in the blood. The symptoms now grew irregularly worse, until the patient had relapsed into a state of extreme cachexia. In this condition, more than two months after the onset, treatment with antistreptococci-serum was commenced. The first dose was of twenty cubic centimetres, and within a week forty cubic centimetres more had been given. There was no reaction, but the condition of the patient improved very rapidly until he was able to sit up, although the temperature curve was not absolutely normal. Six days after the previous series of injections, therefore, a final injection of ten cubic centimetres was made. This was followed by a rise of temperature to 102° F., malaise, and considerable pain at the site of the injection. After this the temperature remained normal, all the physical signs disappeared, and the patient was discharged cured.

A Case of Lobar Pneumonia with a Hyperpyrexial Temperature of 109° F.; Recovery. (*British Medical Journal*, October 24, 1896.) By J. Kymaston Couch, M.R.C.S.

The excessive temperature occurred upon the evening of the second day, before any of the physical signs of pneumonia had developed. There was some delirium, but no other symptoms of cerebral disturbance. On the third day tubular breathing and other signs of pulmonic infiltration

were distinct, and crisis occurred upon the sixth day. Every effort appears to have been made to insure the accuracy of the record, which was taken in the axilla of the three-year old patient.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,
Professor of Therapeutics, McGill University, Montreal, Canada,
ASSISTED BY
D. J. EVANS, M.D.

A Discussion on Sporadic Cretinism and its Treatment. (*British Medical Journal*, September 12, 1896.)

At the Sixty-fourth Annual Meeting of the British Medical Association the treatment of sporadic cretinism was under discussion.

W. Rushton Parker, M.A., M.D., found the following changes after treatment with thyroid extract:

1. A great and rapid diminution of bulk, due to absorption of myxœdematous deposits, seen especially in the collapse of the protruding abdomen; in the spontaneous reduction of umbilical herniæ; in the recession of the previously swollen tongue behind the teeth; in the disappearance of baggy swellings under the chin, above the collar-bones, outside the nipples, and elsewhere; in the thinning of the lips; and in the disappearance of the dropsy-like puffiness of the face, limbs, and other parts of the body.

2. A great and rapid increase in physical development, shown especially by a rapid growth of several inches in height, even in cretins of from twenty to thirty years of age, whose stature had been nearly or quite stationary for many years previously; also by the replacement of the coarse, sparse hair by a more abundant and finer growth; by the eruption in quick succession of teeth which had been long overdue, as in cases where the milk-teeth still persisted at twenty years of age; and by a substantial increase of body weight, after the initial loss from absorption of myxœdematous deposits.

3. A striking diminution of several hideous deformities, especially of the lordosis in the lumbar spine, of the bulky head, of the ugly sinking of the bridge of the nose, and sometimes of the rickety curvatures of the legs. Many cases, however, show little or no improvement in the deformity of the legs, owing to the softening of bones produced by the thyroid extract and to the fact that the majority of cretins are allowed an undue use of their legs during treatment.

4. A rapid and very striking increase of intelligence occurred, as was well seen by comparing the dull, stupid, heavy, listless, often idiotic counte-

nance before treatment with the bright, cheerful, pleasing expression which soon took its place.

Telford Smith, M.D., found that in treating cretinism by thyroid gland the growth of the skeleton became so rapid that some softening of the bones took place, so that the leg bones were liable to become bent if the child was allowed to go about. When bowing of the legs was observed he placed the patient in bed.

John Thompson, M.D., F.R.C.P. (Edin.), had treated five cases of cretinism with thyroid extract. The rate of growth of the patient and the amount of increase in height was in inverse ratio to the age of the patient and to the stage of treatment. In the child, the degree of growth of the different parts of the body seemed in all respects normal. In adult patients the hands and feet changed very little in character, while in adolescents they grew long and became more natural in shape. In young cretins the legs grew faster than the arms; in adolescent cretins the growth of the upper and lower limbs was very nearly the same, while in adult cretins the arms grew more than the legs. Increase of spinal curvature and bowing of the legs were noted as complications of this growth. In the child and the adolescent cretins the characteristic coarse hair was rapidly replaced by hair of a softer and finer quality and of a somewhat duller shade. In adult cretins there was practically no change in the hair after more than two years treatment. Children, adolescents, and the aged seem to improve mentally after about six months of treatment. From being dull, morose, and self-centred these patients become in a varying degree bright, happy, and sociable.

Victor Horsley, F.R.C.S., F.R.S., stated that cretins whose bones showed signs of softening should be kept lying down as they would be in ordinary rickets. Grafting thyroid into the peritoneal cavity was only a temporary measure equivalent to injection of thyroid material, in no way constituting a real transplantation of the gland, which should be effected by embedding the organ in connective tissue.

Dr. J. Finlayson said that grafting was useless with a hope of securing permanent benefit.

On the Bromide of Strontium in Epilepsy. (*Lancet*, September 26, 1896.) By Anthony Roche, M.R.C.P. (Irel.), of Dublin.

The author has found that bromide of strontium can sometimes be borne when the other bromides produce deleterious results. It seems to add to the efficiency of the other bromides when administered together with them.

Carbon Bisulphide Poisoning. (*Berliner klinische Wochenschrift*, July 13, 1896.) By Dr. Stadelmann.

The symptoms of this condition are variable, and consist of digestive disturbances, muscular weakness, tremor, ataxia, increased muscular irrita-

bility, painful muscular spasm, disturbed sensation, sometimes increased and sometimes diminished knee-jerks. There were three cases observed within a short period of time, all of which came from a rubber factory in which the hygienic conditions were not satisfactory. In the discussion Bernhardt said that the poison might affect the peripheral nerves and give rise to a degenerative neuritis and paralysis. The French writers claim that the condition may give rise to hysterical manifestations. But Stadelmann differs from them in this respect. Kronig had seen one fatal case in a patient the subject of Bright's disease. Kahlischer thought that the disease presented the characteristic features of a toxic affection of the nervous system such as is found in poisoning by lead, alcohol, etc. Stadelmann said that he found no changes in the optic disc.—*British Medical Journal*, September 19, 1896.

Antituberculous Serum and its Antitoxin. (*Presse Médicale*, June 10, 1896.) By C. Maragliano, M.D.

In this paper M. Maragliano describes the method employed for the preparation of antituberculous serum and publishes his researches upon the antitoxin which this liquid contains. In order to obtain it animals are inoculated with toxic substances derived from virulent cultures of human tuberculosis. These toxic materials are prepared in two distinct groups: First, a liquid, A, is procured by evaporating the culture at one hundred degrees on a water-bath and filtering it through a Chamberland filter, as is done in the preparation of tuberculin. Second, a liquid, B, is obtained by passing the unwarmed culture through the Chamberland filter and concentrating it in a vacuum at thirty degrees.

Animals which can furnish serum (horses) are inoculated with a mixture of three parts of the liquid A and one part of the liquid B. In the beginning two milligrammes of the mixture are injected for each kilogramme of weight of the animal. This dose is increased one milligramme a day and per kilogramme until forty to fifty milligrammes for each kilogramme are given. After this the same quantity is inoculated for six months. At the end of this time the animal is immunized, because then it resists the inoculation of considerable quantities of toxic materials and the injection of cultures virulent enough to kill the control animal. Three or four weeks after the cessation of the injections there will be considerable toxic material in the blood. The animal is then bled and the antituberculous serum is thus obtained.

This serum contains specific antitoxins which neutralize the action of the tuberculous poisons. Experiments upon healthy guinea-pigs and upon tuberculous guinea-pigs demonstrate the fact. Even upon man affected with tuberculosis this action can be shown, a fact which Professor Reugi has confirmed at the clinic in Naples. This serum possesses a bactericidal property in the test-tube in company with the bacillus tuberculosis. And, what is more, the power of the antitoxic serum can be graduated.—(*Annales de la Policlinique de Paris*, September, 1896.)

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D., New York City,
GUY HINSDALE, M.D., Philadelphia,
WILLIAM BROADDUS PRITCHARD, M.D., New York City, AND
WM. G. SPILLER, M.D., Philadelphia.

The Degeneration of the Pyramidal Tracts after Unilateral Extirpation of the Centres for the Extremities. (*Neurologisches Centralblatt*, Nos. 11 and 12, 1896.) By Max Rothmann, M.D.

The first part of this paper is devoted to a review of the literature on degeneration of the pyramidal tracts after a unilateral cerebral lesion. In the second part are stated the results of the author's experiments on dogs and monkeys for the purpose of determining the frequency of involvement of the pyramidal tract in the oblongata and cord on the side of the cerebral lesion.

He draws the following conclusions:

1. Bilateral degeneration of the crossed pyramidal tract occurs after unilateral extirpation of the centres for the extremities.

2. This degeneration may be found in all recent cases as late as four weeks after the operation, although the involvement of the pyramidal tract on the side of the lesion is often slight.

3. The degeneration of the crossed pyramidal tract on the side of the lesion begins in the motor decussation. The fibres which come from the normal pyramid are injured by the pressure exerted by the fibres from the affected pyramid. This is because in the early stages of degeneration there is a swelling of the fibres.

4. In the course of two to four months after the operation the degeneration of the crossed pyramidal tract on the side of the lesion begins to disappear and later cannot be observed.

5. The persistence of this degeneration in man to later periods is largely due to impaired nutrition of the central nervous system from vascular disease.

6. In some of the recent cases a few degenerated fibres are observed, which pass from the affected pyramid through the interolivary layer to the opposite olive. The significance of these fibres is not known.

7. There is no decussation of pyramidal fibres within the cord from one lateral pyramidal tract to the other.

Rare Forms of Hereditary and Family Cerebral and Spinal Diseases. (*Deutsche Zeitschrift für Nervenheilkunde*, vol. ix., Nos. 1 and 2.) By Heinrich Higier, M.D.

Higier describes a new form of progressive family disease observed in four sisters. The symptom-complex in all the cases was nearly the same.

Hereditary influence could not be demonstrated. The disease began in

the seventh to the twelfth year, and did not immediately follow any infectious process. The first symptom was a feeling of weakness and stiffness in the legs, which gradually increased and resulted in spastic paraplegia and contracture of the limbs.

Three to four years after the beginning of the process the upper extremities began to grow weak, and the movements here became awkward. In the elder sister the muscles of the upper and lower limbs were atrophied. The tendon reflexes in the upper extremities were in part normal, in part exaggerated; in the lower limbs they were intensified. Dysphagia was observed in most of the cases, bradylalia and nasal speech in two, strabismus in one, subluxation of the lower jaw and nystagmus-like movements of the eyeballs in one case. In all the sisters primary atrophy of the optic nerve, limitation of the visual fields, and partial achromatopsia were found, and in one temporary ataxia was noted. Mental weakness was present. No cause for the disease could be detected.

This type corresponds strictly to none of the known forms of disease, although perhaps more to cerebral diplegia than to any other. Higier, in this long and interesting paper, reviews the literature on the subject, and mentions particularly the presence of ataxia in certain forms of cerebral diplegia.

The Course of the Posterior Roots in Man. (*Neurologisches Centralblatt*, No. 8, 1896.) By Alexander Margulies, M.D.

Dr. Margulies examined the cord from a case of general paresis by the method of Marchi. At the level of the sixth thoracic roots a degenerated area was observed in the right column of Burdach, which extended to about the anterior third of this column, occupied about two-thirds of its width, and was close to the posterior horn. In other words, the cornuradicular zone of Marie was degenerated. At the level of the first thoracic roots the degenerated fibres were found pressed inward and separated by a small zone of normal tissue from the septum paramedium dorsale. At this part the degeneration had the form of the letter L, one limb of which scarcely reached the anterior third of the column of Burdach, while the other was near the periphery. At the level of the third cervical roots the degenerated area had diminished in size and was still located on the inner side of the column of Burdach.

It is evident from this that the fibres from the sixth thoracic roots do not enter the columns of Goll. The degeneration may be regarded as tabes insipiens or as the result of cachexia.

Traumatic Ulnar Neuritis, Deviation of the Fingers "en Coup de Vent," Retraction of the Palmar Fascia. (*Revue Neurologique*, No. 18, 1896.) By E. Feindel, M.D.

As a result of injury of the right ulnar nerve the fingers of the right hand were found greatly deviated towards the ulnar side "en coup de vent."

The palmar fascia was contracted. The author has not been able to find a similar case recorded. Muscular atrophy, changes in sensation, and glossy skin were observed in the hand.

The peculiar position is explained as the result of trophic changes of the ligaments, of the fibrous tissues of the hand, and of the articular ends of the bones, and as the result of contraction of the palmar fascia. The deformity was similar to that produced by chronic articular rheumatism, and the author emphasizes this fact especially.

Hemiatrophy of the Face from Central Disease. (Verein für Psychiatrie und Neurologie in Wien, *Wiener klinische Wochenschrift*, No. 20, 1896.) By H. Schlesinger, M.D.

A young man, of twenty-three years, complained of pain on the right side of the neck, dysphagia, and imperfect vision in the right eye. Syphilitic infection was denied. After a time dysarthria and paralysis with atrophy and fibrillary contractions of the right side of the tongue developed. Still later complete paralysis of the right vocal cord, wasting of the right side of the face, narrowing of the right palpebral fissure, increased disturbance of sight, uncertain gait, vertigo, and a feeling of anxiety were noted. The patient did not suffer from vertigo or headache when in the reclining position. There was no history of alcoholic excess. The atrophy of the right side of the face was very evident and involved the bones of the head.

Nystagmus-like movements, slight paresis of the right external rectus, lessened sensation for pain, and absence of reflexes from the mucous membranes on the right side, diminution of the reflex from the palate and pharynx on the left side, paresis of the right masseter, paresis in the distribution of the upper branch of both seventh nerves, and complete paralysis in that of the lower branch, with diminution of the electrical excitability, are reported. The senses of taste and smell were absent on the right side. A tumor could be felt on the right side of the pharynx. The cause of all these symptoms was supposed to be a basal affection and may have had some connection with this tumor.

Electrical Irritation of the First Thoracic Root in Man. (*Berliner klinische Wochenschrift*, No. 34, 1896.) By Professor H. Oppenheim.

Madame Dejerine-Klumpke has demonstrated that the oculo-pupillary fibres in the dog leave the spinal cord by means of the first thoracic roots. Numerous cases since the publication of her experiments have shown that these fibres in man have the same course, but it is not positively known whether the eighth cervical and second thoracic roots also contain some of these fibres. Dr. Oppenheim, after opening the dura of a man, applied the electrode to the second thoracic root without any result, but as soon as the first thoracic root was irritated the pupil on the same side was dilated *ad maximum*. The dilatation lasted a few seconds. As the eyelids had to

be held open, he was not able to observe enlargement of the palpebral fissure.

The Antitoxic Action of Hyposulphite of Sodium against Cyanide of Potassium and Malonitrite. (*Bulletin de l'Académie de Médecine de Belgique*, vol. x., No. 7, 1896.) By MM. Heymans and Paul Masoin.

Malonitrite or "malonique nitrite" has the formula $CNCH_2—CN$. This substance produces a characteristic train of symptoms when given to rabbits and other animals. Hyposulphite of sodium possesses a preventive antitoxic action against malonitrite, as it does against the cyanide of potassium, but this action is more marked. The action of the sodium salt upon the cyanide of potassium was proved by Lang. If the hyposulphite is given before or immediately after the poison, it prevents the symptoms of intoxication. And, furthermore, the hyposulphite possesses a curative action when the intoxication of malonitrite is well established. On the other hand, if the symptoms of poisoning by cyanide of potassium exist at their height, it is impossible to save the animal. When the symptoms of poisoning by malonitrite are well marked, the recovery after the administration of sodium hyposulphite will be observed in two or three minutes if the remedy is exhibited by the intravascular route, in from five to ten minutes if it is given hypodermically, and in from ten to fifteen minutes if given by the mouth.

After the intravenous injection of a quantity of cyanide of potassium less than the fatal dose, it is impossible to shorten the duration of the toxic symptoms, unless the hyposulphite is injected as soon as these symptoms have reached their height. But in poisoning by malonitrite the administration of the antidote will shorten the duration of the intoxication. Antitoxic serums and hyposulphite of sodium when used as antidotes to cyanide of potassium are "preventive blood antidotes," capable of neutralizing poison after absorption. Hyposulphite of sodium holds the position of a "curative cellular antidote" to malonitrite; it is capable of decomposing the combination of the poison with the living substance. This single example seems to justify the prediction that analogous antidotes will be discovered for other chemical poisons and for toxic substances of bacterial origin.

Antipyrin as a Local Analgesic. (*Archives cliniques de Bordeaux*, August, 1896.) By Louis Mencière, M.D.

The author suggests the use of antipyrin as a local anæsthetic in operations on the male tunica vaginalis, in acute tonsillitis, and in the removal of small tumors from the skin. In hydrocele of the tunica vaginalis, after the fluid has been removed, a ten-per-cent. solution of antipyrin in water is injected and allowed to remain in contact with the serous membrane five minutes before the tincture of iodine is applied. This method entirely dispenses with the pain of the latter application.

In cases of acute tonsillitis a gargle, composed of ten grammes of antipyrin, ten grammes of chlorate of potassium, one hundred grammes of peppermint water, and two hundred grammes of distilled water, is used whenever the painful crises occur.

Subcutaneous injections of from ninety centigrammes (thirteen and a half grains) to one gramme (fifteen grains) of antipyrin were used by the author to lessen the pain of the removal of a pigmented epithelioma from a man, aged sixty years. The injections are free from the dangers of cocaine; but they do not replace that drug as a local anæsthetic.

Antipyrin used in this manner is not a complete pain-destroyer; its analgesic power does not correspond at all with the results obtained when used as a gargle or when injected into the sac of a hydrocele.

Partial Epilepsy in Acromegaly. (*Medical Record*, September 26, 1896.)—Drs. Raymond and Souques have reported a case of acromegaly of many years' standing in a man aged fifty-four, who in the last three years had developed Jacksonian epilepsy limited to the right upper extremity and right side of the face. They stated that the hypertrophy of the pituitary gland, in their opinion, constituted a cerebral tumor capable of exciting from a distance the cortical psychomotor centres.

Cord Lesions produced by Microbic Toxins. (*Medical Record*, September 26, 1896.)—At the French Congress of Alienists and Neurologists, held at Nancy in August, 1896, Dr. H. Claude, of Paris, reported his studies of cord lesions produced by microbic intoxication of four cases, as follows: 1, a guinea-pig, poisoned gradually by the toxins of the colon bacteria, became paralyzed in one foot, then in two feet; 2, a dog poisoned by the toxins of diphtheria, in the course of a month, paresis of the hind feet; 3, a dog poisoned by the toxins of tetanus (two months), developed posterior monoplegia, then paraplegia, and finally paresis of all the limbs; 4, a rabbit, poisoned by pyocyanic toxin, died without paralysis. Besides gross lesions of the vessels, Claude found centres of softening and infiltration of leucocytes; also cell alterations, varying with the degree and intensity of the intoxication and the part of the cord acted upon by the toxins. In the cases of slow intoxication there were all degrees of cell-changes in the cord, and, alongside elements still intact, there were others entirely degenerated.

Intradural Section of the Spinal Nerves for Neuralgia. (*Boston Medical and Surgical Journal*, October 1, 1896.) By Robert Abbe, M.D.

This new procedure for the relief of intractable cases of neuralgia involves a laminectomy of a number of vertebræ, the exposure of the dura, the verification of the spinal roots by a battery, and excision of the sensory roots. Dr. Abbe has operated on three cases as follows: (1) Male, aged forty-four; for nearly two years ascending neuritis, pain in the right arm,

following violent work. He had many operations, including amputation at the shoulder. Acquired morphine habit. Both roots of the sixth and seventh cervical were divided outside the dura, but inside the spinal canal. No evidence of permanent relief after eight years. (2) Male, aged forty-five; exposure to cold; ascending neuritis in left arm; many operations on the nerves—resection and stretching—with no relief during two and a half years; agonizing pain, paroxysmal and constant; morphine habit. The posterior roots were divided intradurally,—sixth, seventh, eighth cervical, and first dorsal. Immediate relief from pain with some return in the second week. Six years later an inmate of an invalid home. Relatively slight evidences of pain. (3) Male, aged forty; incessant athetoid movements of the arm with intense neuralgia of the forearm; amputation below the shoulder attended with no benefit; bulbous nerve-ends dissected out. The posterior roots were divided from the fifth cervical to the first dorsal, and three ounces of the spinal fluid escaped; the anterior roots of the sixth, seventh, and eighth cervical, and first dorsal were also cut. Eighteen months later there was none of the former athetoid movement nor the objective evidence of suffering such as had formerly been present, though the patient stated that he still had some pain. References to four other cases, by Bennett, Horsley, and McCosh, are rather encouraging to the further trial of this operation.

Report of Thirteen Cases of Multiple Neuritis occurring among Insane Patients. (*Medical News*, October 3, 1896.) By E. D. Bondurant, M.D.

These cases occurred between November, 1895, and February, 1896, in a hospital holding twelve hundred patients, at Tuskaloosa, Alabama, two hundred miles north of the Gulf of Mexico. Four cases were in white men and eight were in white women. One was in a colored woman. The neuritis affected the lower extremities in all the cases, and the lower extremities alone in ten of the cases. The other three cases, in which the nerves of the arms and body became involved, all proved fatal, although only one of these fatal results could be attributed directly to the neuritis. In one case the neuritis followed in course of a miliary tuberculosis, in one it followed a bilious attack, in one, the Flechsig treatment for epilepsy. In one case there was a doubtful malarial infection; in the other cases there was no assignable cause. The patients were young or middle-aged, and had been in the institution some time; four were epileptic; all were demented more or less; none had used alcohol, and in only one case was a (doubtful) history of syphilis obtained.

In most of the cases there were evidences of an acute general toxæmia, usually noted for a day or two before the local symptoms attracted attention; in three cases no symptoms of general disease were noted. The blood of several of the patients was examined for the plasmodium of malaria without success. There were sometimes distinct chills at the onset, a rise

of temperature, anorexia, dryness of the mouth and throat, furred tongue, and pain in the legs increasing in severity. Muscular weakness and incoordination were then noticed, and sensory disorders, diffuse or irregularly distributed areas of hyperæsthesia or (rarer) anæsthesia; tenderness on pressure was common. The tendon reflexes were abolished in all cases. The autopsies were without result as far as the neuritis was concerned.

The Traumatic Neuroses in their Medico-Legal Relations. (*Medical Record*, September 26, 1896.) By A. L. Hall, M.D.

The author's conclusions are:

1. The surgeon should be an equal authority with the neurologist in determining the sequences of trauma upon the nervous system.

2. Neurasthenia is the usual form under which traumatic neurosis expresses itself, and its symptoms are indistinguishable from neurasthenia arising from other than traumatic influences.

3. The actual condition of the patient previous to the accident must be known in order to reach a correct estimate of the damage from injury sustained by the nervous system.

4. The type of symptoms manifested by the neurosis, whether neurasthenical or hysterical, is oftentimes a question of vital importance in the adjudication of a claim for damages.

5. Traumatic neurosis occurs oftenest at the centres of population, but it is by no means a rare affection in the country districts.

6. It is probable that traumatic neurosis is dependent upon some definite—yet unknown—change in the arrangement and structure of the cellular elements of the nervous system, which gives rise to stable rather than unstable symptoms.

7. A stable, well-organized symptom complex indicates damage to the nervous structures; while instability of symptoms and want of orderly arrangement denote trivial injury,—and, if long continued, simulation is rendered probable.

8. The so-called "objective symptoms" depend upon the psychical rather than the physical state of the subject, and are unreliable guides to diagnosis.

9. A correct diagnosis is best obtained from a reliable account of the accident, the history of the previous state of the patient, the presence of surgical troubles, and the existence of a stable, well-defined, organized symptom complex.

10. The term "traumatic neurosis" is an expression for an indefinite condition, and a simplification of the subject is desirable from a clinical stand-point.

Epilepsy: Treatment by Pituitary Extract. (*Archives de Physiologie*, 1896, No. 3.)

MM. Mairel and Bosc have reported their experiments with pituitary

extract of animals, in the case of healthy individuals and in the case of twenty-one epileptics; of the latter six were men and fifteen were women.

The remedy produced a slight elevation of temperature, a somewhat greater rise in the pulse. The agent was used by the mouth and hypodermically in the dose of one to four pituitary glands of the ox daily. The attacks of epilepsy were not diminished in number. The use of the extract was followed in some cases by mental excitability approaching delirium.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

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AND

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Experiences with Laborde's Rhythmical Traction on the Tongue, with Remarks on the Injuries caused by this and other Methods of Resuscitation. (*Centralblatt für Gynäkologie*, 1896, No 28.) By Ludwig Knapp, M.D.

Laborde announced his new method of resuscitating the apparently asphyxiated to the Paris Academy of Medicine in July, 1892. It consists of merely drawing forward the tongue rhythmically until the first spontaneous inspiration takes place. It causes a reflex irritation of the respiratory centre through the nerves of the tongue and throat. Knapp reports briefly eleven cases on whom this method was tried successfully,—in ten it was tried as a last resort after other methods had failed. He concludes:

1. Even in desperate cases one should not despair of saving the infant's life.

2. Laborde's method should be used exclusively in a larger number of cases before forming a final judgment in regard to its work.

3. Should its claims be substantiated, it must be looked upon as a valuable addition to our methods of resuscitating apparently asphyxiated infants in that it is especially adapted to those cases which are not suited for Schultze's method,—namely, premature infants.

4. On account of its simplicity, Laborde's method is free from objection. It is grounded upon the physiological connection between certain glossopharyngeal nerves and the medulla.

5. An advantage, not to be underrated, lies in the fact that the method can be practised on the infant while in the warm bath, obviating the dangerous cooling of the body necessitated by the other methods.

6. The method is unusually simple and easy to learn. It has the advantage—important in private practice—that its employment does not make the disagreeable impression upon the by-standers or upon the newly-delivered mother that the others do.

Knapp then gives the history and the post-mortem findings in a case in which all efforts at resuscitation failed. After working over the child for two hours and a quarter shallow respiration was established, but death followed eight hours later.

Clinical Results of Nearly Five Hundred Vaginal Hysterectomies. (Jacobs.)—In No. 29 of the *Centralblatt für Gynäkologie* for 1896 is a report of the last meeting of the Belgian Gynæcological and Obstetrical Association, at which Jacobs read a paper in which he reported a series of four hundred and ninety-nine vaginal hysterectomies, with a mortality of seventeen, or only a little over three and four-tenths per cent.

The indications for the hysterectomies were as follows:

	Cases.	Deaths.
Carcinoma	49	...
Adenoma	14	...
Fibroma	42	3
Ectopic pregnancy	3	1
Hydrosalpinx and pyosalpinx	37	2
Double pyosalpinx	176	7
Chronic inflammation of appendages	136	3
Complete prolapse	24	1
Secondary hysterectomy after laparotomy	17	...
Total	498	17

He prefers the thermo-cautery to either knife or scissors in the first steps of the operation, as it causes less hemorrhage and insures better drainage. He uses clamps on the broad ligaments, two or three on each side, and then replaces them with silk ligatures, finally closing the vaginal wound by a silk suture passed through both peritoneum and vaginal wall. In septic cases, where drainage is required, he uses gauze moistened with sterilized glycerin.

Changes in the Uterine Mucosa after Castration. (*Centralblatt für Gynäkologie*, 1896, No. 30.) Dr. Eckardt.—As a result of the microscopical examination of a uterus removed from a patient on whom a double salpingo-oöphorectomy had been performed two years previous, Eckhardt concludes that "the mucous membrane of a uterus in which atrophy has been caused by castration undergoes the same retrograde changes that accompany senile atrophy,—namely, the cilia of the epithelium are lost, the epithelium and the interglandular stroma atrophy, and the glands become less numerous and tend to become cystic."

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

A CASE OF CONTRIBUTORY NEGLIGENCE DEFEATING AN ACTION FOR ALLEGED MALPRACTICE.

An action [1] for damages for alleged malpractice was brought by a free patient at the H. Hospital against one of the surgical staff of that hospital, who happened to be on duty at the time the plaintiff was in the hospital. The plaintiff, R., a carpenter, was injured on December 5, 1890, by falling from a scaffolding on which he was working, and shortly afterwards was conveyed to the H. Hospital, where he remained until December 18, when he left the hospital, going to the town of W., where he remained until the 23d, when he went to B., arriving there on the night of the 23d.

The next morning a physician was called, who declared that the plaintiff had a complete oblique fracture of both bones of the left leg an inch or so above the ankle. There was no allegation of negligence until a short time before suit was brought, on April 22, 1892. The case was tried three times: the first trial resulted in a verdict of $5512.50 for the plaintiff, which the court set aside; the jury disagreed on the second trial; the plaintiff obtained a verdict of $12,000 on the third trial, although in his statement damages were laid at $10,000. The court refused to order a new trial, but required the plaintiff to abate all in excess of $4000, which he did, and from this the defendant appealed.

In his statement of claim the plaintiff alleged that he had sustained a fracture of both bones of the leg a short distance above the ankle-joint, and was treated not for a fracture, but for a sprain, and was thereby greatly injured. It was not claimed that the treatment was improper for a sprain, but that it was entirely incorrect and inadequate for a fracture. The defendant denied most positively that there was a fracture, and his testimony is supported by that of two other surgeons who saw and examined the plaintiff's leg on the day and immediately after the injury was sustained, and also a number of surgeons who examined it at subsequent times, and testified that, in their opinion, there never was a fracture. The great controversy in the case turned upon two points: first, whether there ever was a fracture, and, second, whether the subsequent condition of suf-

[1] Richards *vs.* Dash, 176 P. S. 181 (1896).

fering and illness of the plaintiff was produced in whole or in part by acts of contributory negligence on his part. If there was no fracture, or if the plaintiff's negligence contributed to the injury, in either event, he had no case, and on both these points the trial court so instructed the jury.

On behalf of the plaintiff, one surgical witness, Dr. E., testified that he first saw him on December 23, 1890, or eighteen days after the accident, at his office in B., and that he readily and in a very few minutes found a complete fracture of both bones. In the fracture of the tibia the lower portion of the bone projected up over the upper portion about half an inch, and made a distinct ridge, easily perceived by the eye and, of course, by the touch. Dr. C., a surgical witness who was called in on January 23, 1891, testified that he inserted his finger in a hole in the leg which had been produced by suppuration and found the ends of broken bones overriding each other, and testified that there was a fracture of the tibia. He knew nothing about the fibula. Two other surgeons, neither of whom had seen the leg until long after the accident, testified as to general matters relating to fractures and their treatment. Their testimony and that of Drs. E. and C. constituted the whole of the plaintiff's surgical testimony.

All the surgical testimony in the case, both for the plaintiff and defendant, establishes the fact that fractures of the tibia are most easily discoverable, the reason being that the tibia has very slight covering over it in the way of muscles, tissue, or flesh.

The testimony of the defendant, denying the existence of a fracture, was equally positive, ten surgeons, several of them of great eminence and wide experience, so testifying. Dr. M., the first surgeon called to see the patient after the accident, testified that he made a careful examination of the leg in the usual manner by inspection and manipulation, and found the patient was badly bruised, but that no bones were broken, and it was in accordance with his advice that the patient was sent to the hospital. The same surgeon was examined at the second trial, in June, 1893, and repeated that there was no fracture when he first examined the leg of the patient; and, being asked a long question which described the fracture as testified to by Drs. E. and C., said that there was no evidence of the fracture when he saw him first, and he found no evidence of fracture when he saw him last.

Dr. N., the resident surgeon at the hospital, next saw the patient after the accident. He went with the ambulance and assisted in removing the patient to the hospital, first making an examination at the place where they found him. After he reached the hospital the patient was undressed and put to bed, and he then proceeded to make a full and thorough examination of the leg by all the usual and well-known methods practised by surgeons in such cases. He compared the two legs for shortness, manipulated the limb with his hands, following the bones as far as he could; he then examined for crepitus, and then tried it for mobility by taking hold of it by the heel and twisting it, holding the leg fixed. He was unable to find any

evidence of fracture, and diagnosed the case as one of sprain and concussion, and treated it accordingly with hot compresses and hamamelis extract, to allay pain and reduce swelling and inflammation. About four o'clock the same afternoon Dr. D., the defendant, employed all the usual methods of examination without discovering any fracture. The following day he made another examination, which is thus described by him: "The next examination was made, I think, a day or so afterwards, and then the examination was more thorough. I would take the leg in both hands, one hand at the heel and the other at the ankle-joint, and made the ordinary manipulations. *Q.* Now, what were those? *A.* Well, it was from one side to the other, up and down. Those were the ordinary manipulations, in the first place, to find out if there was any crepitation, and, in the second place, by putting it side by side we would see if there was a fracture; the portion of the bone, perhaps, could be felt by the finger. These are the manipulations: Taking this portion of the heel in my hands and working it backward and forward in that manner and then working it up and down so" (explaining to the jury). He had previously stated in the other part of his examination thus: "I then examined him by running my hands over the spine of the tibia, down the course of the fibula; didn't make much motion; compared one leg with the other to see if there was any shortening; there was no apparent shortening at all." He made several of the examinations while the patient was in the hospital; four or five in all. He was asked, "*Q.* Well, doctor, what conclusion did you arrive at as regards this case? *A.* That there was no fracture."

Commenting on this portion of the defendant's evidence, the Supreme Court said, "Now there was not a particle of testimony in the case that this was not the usual, correct, proper, and sufficient method of examination in ordinary use by all surgeons, and, so far as this subject is concerned, there was no testimony to the effect that this was incorrect practice in any degree. Three skilled, competent, and careful surgeons, in full practice, testified, after having seen and carefully examined the plaintiff immediately after the accident and on succeeding days, that there was no fracture of the leg. The treatment given him was the proper and usual treatment if there was no fracture, and there was nothing in the testimony upon which a right of recovery could be based, except that there was a fracture, in fact, which was not discovered by any one of these three surgeons, but was discovered by two other surgeons, the first of whom saw the patient eighteen days after the accident, and the other of whom first saw him forty-eight days after that event.

"On behalf of the defendant, six other surgeons were examined, several of them of the largest and most extensive experience, thoroughly competent in every way, all of whom examined the plaintiff's leg at different times, and every one of whom testified that in his opinion the leg was never fractured, giving his reasons with much detail. Dr. H., one of these witnesses, was of opinion that no fracture ever existed, and he attributed the present

condition of the plaintiff's leg to a high degree of inflammation, to caries, and a part of it to surgical interference subsequent to that,—operative procedure, in other words. A careful examination by him of the spine of the tibia disclosed no fracture, although a fracture such as described 'would most undoubtedly be shown, couldn't fail to be shown,' if it were there. Dr. J., a surgeon of forty years or more and a railway surgeon for over thirty years, and who had seen six or seven thousand cases of accident, testified that he had examined the plaintiff's leg three times, and, being asked whether there had been a fracture, said, 'There is no evidence to me that he had a fracture at the time stated nor of the kind referred to. I don't think he could have had such a fracture and have his limb present the appearance that it does at the present time.' He then explained fully to the jury the reasons for his opinion,—among others, that he had followed the spine of the tibia down to the ankle-bone, and it was perfect without any line of deformity, and that there was no evidence that the bone of the tibia had ever been thrown forward a quarter or half an inch. He also measured the legs and found them absolutely of the same length. Dr. B., a surgeon of large experience, found no evidence that there had ever been a fracture. Dr. O., a surgeon of more than forty years, with an enormous experience in the hospitals, in the army all through the war, and in his private practice, testified that he had examined the plaintiff's leg very carefully by feeling it, measuring it, and comparing it with the other leg, and the fracture as described by the plaintiff's surgeons having been explained to him, said, 'There is no evidence of there ever having been such a fracture.' He said he measured the leg and found no shortening in it; that he had run his finger down along the spine of the tibia and found no prominence or depression at the place of the alleged fracture. Drs. K. and F., both surgeons of more than twenty-five years, and largely in hospitals and railway service, found no evidence that the bone was ever fractured. In addition to all this, Dr. L., who treated the patient's leg after Drs. E. and C. were unable to help him, said that the plaintiff had tuberculosis of the tibia, and that he had treated him successfully for the disease, but found no evidence of a fracture."

Commenting on the testimony, as in the previous review, the Supreme Court said, "It is sufficient to say the great preponderance of testimony, and that which was best informed and most reliable, tended to show that there never was a fracture of the limb such as was testified to by Drs. E. and C. The most experienced surgeons easily accounted for the conditions to which the witness testified. Dr. H. said, 'I think the action of the patient in leaving the hospital was very injurious to his limb and was the cause of his condition at present.' He was asked, '*Q.* Doctor, where there has been an injury to a leg in the region of the ankle, followed in a few days by severe inflammation extending in and around the joint, which leg is examined by a surgeon at the end of three weeks from the accident, at which time the periosteum is carried away or roughened, and

the bone roughened, and small pieces of bone have come away, would a physician be liable to be mistaken as to his diagnosis as to that being a case of fracture? *A.* He might be. He would be much more likely to be mistaken in his diagnosis than for the man to have gone home in that condition.' Dr. M., being asked whether he would not expect Drs. E. and C. to be correct in their diagnosis because they had examined the leg recently after the accident, said, 'I would expect them to be correct, and I would say that Dr. E. was correct if I hadn't examined this limb since and found that he was mistaken.' He was asked, '*Q.* Well, suppose he got his finger into the wound, would the disease, tuberculosis, be likely to develop such a state of affairs as to lead him to suppose that there was a fracture when no fracture existed? *A.* Yes. *Q.* How would that be? *A.* Well, if he got his finger into a bone that was denuded of its periosteum, and in which caries was going on, it would convey to his finger the same sensation that the ends of the bone would after having been rounded off by some little period of time; the same sensation would be conveyed to his finger, and also, if a probe was put in, the same sensation would be conveyed to the end of the probe as in the case of fracture, and in the case of disease he wouldn't be able to tell the difference.'

"Dr. E. never effected any cure of the plaintiff's limb, although he continued to treat him for about a year for fracture. He said, 'Well, he failed to improve after Dr. C. and I had operated on him several times. I sent him to the city of P., to the hospital, and gave him a letter to Dr. P. describing his case.' It was at this time that he came under the treatment of Dr. L., who said that he discovered no evidence of fracture, and treated him successfully for tuberculosis of the bone, which was the disease which he said the plaintiff really had.

"It must be remembered," comments the Supreme Court, "that nobody has ever seen this alleged fracture. Neither Dr. E. nor Dr. C. ever opened the leg and obtained an actual sight of it. So far as their testimony goes, it was simply their opinion that there was a fracture. But Dr. L. did open the leg down to the bone, and cut away a considerable quantity of decayed bone, and he said there was no evidence of fracture."

As to the first point, therefore, whether there ever was a fracture, and the plaintiff's right of recovery depending upon the existence of such fracture, the Supreme Court, considering the testimony as above reviewed, adds, "If there was no fracture there is not a spark of testimony in the case upon which a recovery could be based."

The second point of the case, whether the subsequent condition of suffering and illness of the plaintiff was produced wholly or partly by acts of contributory negligence on his part, will now be considered.

There was an attempt by the trial court, in the charge to the jury, to distinguish between the injury to the plaintiff, supposing he was negligently treated up to the time of his leaving the hospital, and the injury which resulted from his own negligence in leaving the hospital when he

did, and his subsequently going to W., remaining there five days without any treatment, and then travelling to B., upward of two hundred miles distant, for further treatment. "That the plaintiff's act of leaving the hospital," says the Supreme Court, "at the time he did, and in the condition he was then, was an act of negligence on his part cannot be questioned. Now, his subsequent conduct in travelling to W. and B., if it resulted in the severe consequences that followed, was still more negligent, according to the universal testimony of all the surgeons. Whether he would have been cured if he had remained at the hospital a longer time, as Dr. N. testified he would have been, cannot now be known because of his own voluntary act of leaving. It is impossible, therefore, to distinguish between the consequences which resulted from his ultimate act of leaving and those which might have resulted if he had remained. He might have been cured if he had remained, or he might not, and it is not possible now to determine that question. But that impossibility results from his own action, and therefore no distinction can be made, as the source of a right of action, between the consequences which might have happened had he remained and the consequences which did happen after his departure. The answer that it is not possible to determine that question is because, notwithstanding his sufferings, he might have recovered if he had remained. Now, as to his subsequent contributory negligence the evidence is simply overpowering, and is not really contradicted. Nearly all the surgeons were inquired of as to that, and they all concurred in their views." The evidence here referred to is as follows: Even the plaintiff's own surgical witness, Dr. E., admitted that his travelling from the hospital to W., and from there to B., would have a very bad effect upon the patient. He was asked, after describing in the question the journey and the leg, and the effect upon it, "*Q.* And the bones would cut through the flesh? *A.* They might. *Q.* Well, they did it, didn't they? *A.* Well, there was a hole there. *Q.* And wouldn't everything you saw in relation to that man's condition, as he came to you at Bedford, be explainable upon the idea that in this travelling and this motion the fragments had cut themselves through the skin? *A.* It might have produced the result; yes, sir. *Q.* And didn't you swear on the last trial of this case, 'The bones would cut as R. was walking around and moving the limb, the ends of the bones would cut as the muscles would contract, would draw apart and injure the soft parts, and open the skin to the outside, by which germs would get in there and produce the condition I found him in'? *A.* Yes, sir; that is correct. . . . *Q.* Could fragments of the bone cut their way through the flesh in less than six days, and hasten blood-poisoning? *A.* Yes, sir. *Q.* Was the inflamed condition of the wound, the death of the bone, and blood-poisoning attributable to inflammation, caused by the moving of his limb about, laceration, and abscesses, and entrance of air to the injury? *A.* I think so; yes, sir.'"

Dr. H. was asked a long question which described the movements of

the plaintiff after leaving the hospital, as testified by himself, and at the conclusion he was asked, "Did the action of the plaintiff contribute to produce this condition, as found by the doctors on his arrival at B. and subsequent thereto? *A.* Well, most emphatically. If the man only had an injured joint, if he had an inflammatory action there at all, that would be, I consider, almost suicidal for a man to attempt anything of that kind, and, if a fracture existed, as a matter of course it would be a great deal worse. *Q.* What would you say as to the possibility of a man making a trip, and making the movements as I have described them? *A.* What do you calculate in the possibility, fracture as described in this case? *Q.* Yes. *A.* Well, I don't know anything about a man's physical endurance, but it doesn't seem possible to me that a human being would be able to undertake an action of that kind." And the witness then explained at length the reasons why it could not be done. Dr. J. was asked the same long question as Dr. H., and his answer was, "Assuming that he had that condition of limb, and that he survived and did all those things, it is a wonder he is alive." And again, "I think the action of the patient in leaving the hospital was very injurious to his limb and was the cause of his present condition. I can't think otherwise." He further testified that he did not believe the plaintiff had any fracture, because he could not possibly make such a journey if he had.

Dr. M. was asked the same question, concluding with the inquiry whether the journey contributed to the condition in which the plaintiff was when he reached B., and his reply was, "My opinion would be that that would be entirely sufficient to account for the conditions that were found by Dr. E. at the end of the journey."

Drs. B., D., and O. gave similar answers to the same question, the latter adding that it would have been utterly impossible for the plaintiff to make the journey with such a fracture at the time. Dr. K. also said, in reply to the same question, "Yes, sir, the travel would do that." When asked to give his reasons he said, "Well, if he had a fracture without a splint on, the movement of the fracture caused by his travelling would so irritate the surrounding parts that inflammation would set up, and the probability is that owing to the proximity of the artery of the foot to these fragments, admitting that it was a fracture, the sharp edges of these fragments would probably cut off the artery, or at least endanger it; at any rate it would get up such an inflammation that the foot would be gangrenous; it would produce gangrene of the foot, provided he went through all detailed."

(To be continued.)

BOOK REVIEWS.

A Manual of Venereal Diseases. By James R. Hayden, M.D. 8vo, pp. 267. New York and Philadelphia: Lea Bros. & Co. 1896.

This little work, the author tells us, is intended to be an epitome, and, omitting the statistical and historical sides of the subjects embraced under its title, the practical or clinical side, which is that mostly sought for by student and practitioner alike, is that which is described.

The work commends itself at once to the reader on account of its brevity and clearness of style. Part I. is devoted to the discussion of gonorrhœa and its complications, and, on the whole, is well written and practical, although one would expect nowadays to see more prominent mention made of antiseptic medication in the treatment of urethritis. We are a little surprised, too, to find how frequent an occurrence, according to the observation of the author, the involvement of the posterior urethra is. He tells us that "in from eighty to ninety per cent. of all cases of acute anterior gonorrhœa the disease passes rapidly down the urethra to the bulb, and thence into the posterior portion, so that posterior urethritis, instead of being a complication, as was formerly thought, is in reality the usual course of the disease."

The chapters devoted to the discussion of stricture of the urethra, its diagnosis, and its treatment are surprisingly full and comprehensive for a work of the size of this, the fifty pages devoted to this matter containing in a well condensed form excellent descriptions of methods and procedure in treatment, every step being so well depicted that even the most inexperienced could not go astray were he to adhere closely to the directions given.

In Part II. the chancroid and its complications and their treatment are described. We are glad to see that the writer is not a believer in routine cauterization of chancroids, reserving this measure for those sores which show a tendency to destroy surrounding parts.

The third and last part of the work is taken up with the subject of syphilis, which is described in a very terse and satisfactory manner, the descriptions of the eruptions being especially good. The narrations of the syphilitic affections of the various organs of the body are good, and quite sufficient to convey to the mind of the reader clear ideas on the subject. In the matter of treatment the writer believes that it should be intermittent, and not continuous in character, but believes that its duration should be from two to three years.

This little volume is, on the whole, quite up to date. It is well written, and, for the purposes for which it is intended, will be found very useful.

T. R. N.

The Physician's Visiting List for 1897. Philadelphia: P. Blakiston, Son & Co.

This well-known pocket visiting list is now in the forty-sixth year of its publication. The publishers evidently expected that better times are in store for the practitioners of medicine in 1897, as they have added twelve pages to the space allotted to the cash account above that given to this department in their last edition.

H. W. C.

A Vest-Pocket Medical Dictionary. By Albert H. Buck, M.D. William Wood & Co. 1896.

An excellent reference book of over 500 pages, $3\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{2}$ inches. We looked for a number of drugs before noticing on the title-page that these are excluded from the work. The medical student, for whom, of course, the work is primarily intended, wants information in regard to spelling and dose as much as anything else for which he desires a dictionary. Much increase in size could be guarded against by a careful selection of the words introduced.

H. W. C.

Food in Health and Disease. By I. Burney Yeo, M.D., F.R.C.P.; Examiner in Medicine at the Royal College of Physicians; Professor of Clinical Therapeutics in King's College, London, etc. With illustrations. New and revised edition. Philadelphia: Lea Brothers & Co. 1896.

Within late years the members of the medical profession at large have had their attention called to the importance of a knowledge of "food stuffs," their uses and abuses, together with the conditions affecting the nutritive value of same.

Upon this subject many eminent writers have contributed volumes. The general profession more than ever appreciate the fact that diet is an important factor in the cause and cure of many chronic affections, while a number of specialists rely largely on systematic feeding and rest as a most important adjunct to successful treatment. In the work under consideration, Dr. Yeo has given a most instructive and interesting contribution to this science, a "practically useful guide to the subject of dietetics," and we consider it a valuable addition to the physician's library.

The book is well systematized, and divided, primarily, into two parts, Part I. treating of "Food in Health," Part II. of "Food in Disease." Part I. includes a number of interesting chapters, among which are classification of foods, metabolism, cooking, preparing and preservation of foods; certain complete dietaries, as prison, soldiers', and seamen's dietaries; food in relation to age and condition, and relative value of animal and vegetable foods, vegetarianism, etc.

In Part II. Dr. Yeo gives complete chapters on the dietetic treatment of disease and convalescence. Among these we note diet in diseases of digestive organs, including dyspepsia, acute and chronic gastric catarrh, constipation, etc.; diet in albuminuria, diet in gout and calculous disorders, diet in acute and chronic rheumatism, rheumatoid arthritis, etc.; diet in skin-diseases, dietetic treatment of obesity, etc.; also contains special dietetic cures, as the dry cure, milk and whey cure, the koumiss cure, the grape cure, etc.; artificial digestive agents and artificial alimentation, etc.

There is an interesting appendix, including five chapters, on hospital dietaries, the sterilization and Pasteurization of milk, an invalid's dietary, and numerous selected recipes.

Although all chapters are quite complete in themselves, we think a few worthy of special mention.

In Part I. the chapter on "Food in Relation to Age and Condition" would be a valuable addition to any work on practical medicine. It embraces the subject of "Food in Infancy and Childhood," discussing the various substitutes for milk and comparative value of infant foods in general; infant feeding, a list of diets for training, and food at school, the importance of proper food and care during this epoch of one's life being particularly emphasized. The chapter on "Annexation of Foods" explains clearly the functions of the various secretions of the gastro-intestinal tract, with a study of absorption and assimilation. The nutritive value of the various articles of diet and their digestibility are also spoken of at length.

A thorough knowledge of these subjects is essential to the intelligent application

of the dietetic remedies suggested in Part II., particularly in that chapter devoted to the dietetic treatment of diseases of the digestive organs, in which Dr. Yeo, besides explaining most clearly the pathological conditions attending the different affections coming under this head, includes a number of diets for the prevention and treatment of these common complaints.

Simple suggestions as to the dietetic treatment of adult and infantile diarrhœas close this instructive chapter.

Chapter III. of Part II. treats of food in diabetes, and is probably the most exhaustive in the book.

The various pathological theories that have been advanced to explain this state are broadly discussed, and numerous tables of diet for slight, medium, and grave cases are appended. The relative value of different mineral waters recommended is also considered. The chapter on food in rickets, scrofula, and consumption is also very complete. In connection with the subject of pulmonary consumption, an extract from Dr. Weber's lectures calling attention to the possibility of a relationship between the life of the tubercle bacilli and quality and quantity of food taken, especially salts, offers subject for much thought and investigation. The book throughout is well written, comprehensive, and all the statements and suggestions are based upon recent scientific investigation.

We take pleasure in recommending it to students and physicians.

R. S. J. M.

DEFORMITIES: A TREATISE ON ORTHOPÆDIC SURGERY. By A. H. Tubby, M.S., London, F.R.C.S., England. 8vo. Illustrated, pp. 598. Price $5.50. Macmillan & Co., 1896.

The appearance of a new work on orthopædics shows the continued activity in this special branch of surgery. The present volume is the outcome of several years' work in the special London hospitals, and is particularly interesting as an illustration of transatlantic practice. The writer has paid especial attention to the repair of tendons, and has repeated the celebrated experiments of Mr. Adams in view of the wider pathological horizon of the present day. In regard to the immediate rectification of deformities after tenotomy, we are surprised to find that he still advocates the gradual method, a practice which differs essentially from the methods here employed. The work does not include all phases of the diseases of the bones and joints, such as tubercular osteitis and arthritis of the hip and knee, as the English practice, unlike our own, does not include these. The definition of orthopædic surgery in the latest American work, "Young's Orthopædic Surgery," includes "the preventive, mechanical, and operative treatment of chronic and progressive deformities."

The author has quoted liberally from standard works, and has expressed his sense of indebtedness to the many admirable writers who have recorded their experiences in the *Transactions of the American Orthopædic Association.*

As a reference work for practitioners and advanced students, the work is admirable, but as a text-book it is not as desirable as some of those already in the field.

The illustrations are excellent and the publishers deserve praise for the beautiful appearance of the book.

J. K. Y.

ITEMS OF INTEREST.

The Fiftieth Anniversary of the Discovery of Anæsthesia.

On October 16, 1846, the operating theatre of the Massachusetts General Hospital was the scene of the most important discovery in the domain of surgery since surgical practice began. On that day Dr. William Thomas Green Morton demonstrated, before a number of Boston's foremost surgeons, the practical application of the vapor of chloric ether to the relief of pain during surgical operations. The claims of Dr. Morton, who was a Boston dentist, had met with the usual amount of scientific scepticism, and even at the hour of his success failure seemed to be about to reward his efforts. Dr. Morton first successfully extracted a tooth from a man named Eben Frost, who had previously been put under the influence of the vapor. The medical and scientific world were then apprised of the discovery through an operation which Dr. J. Collins Warren performed at the Massachusetts General Hospital on one Gilbert Abbott for the removal of a vascular tumor beneath the left side of the mandible. Dr. Morton, who was somewhat troubled in finding a suitable inhaler with which to administer the vapor, was a little late in arriving at the hospital on the day of the operation, and when he reached the operating room he found Dr. Warren about to begin the incision. In a short time the patient was etherized, and the tumor was removed without painful sensation of any sort to the patient. The records of the hospital say that Abbott experienced "only a sensation like that of scraping the part with a blunt instrument." At the conclusion of the operation Dr. Warren said to the wondering audience, "Gentlemen, this is no humbug." Other cases were operated upon in quick succession, and the use of the drug has become in our day a routine practice. Our English brethren who heretofore have been loud in their praise of chloroform are gradually forsaking their allegiance to that drug and are becoming advocates of ether as the safer anæsthetic. Possibly the tenacity with which the English surgeons have clung to the use of chloroform may be explained by the fact that Sir James Y. Simpson was the first to describe the practical application of the drug.

The fiftieth anniversary of this important discovery was celebrated in France by a commemorative festival on a large scale, which was organized by the Medical Press Association. The committee was composed of such men as Cornil, Lucas-Championnière, Lannelongue, and Reclus. The Society of Anæsthetists, of England, also celebrated the event. In Boston

the discovery was commemorated by a jubilee celebration held at the Massachusetts General Hospital. The following is the programme of the exercises of the day.

Address of Welcome, by Charles H. Dalton, Esq., President of the Massachusetts General Hospital.

"Reminiscences of 1846," by Dr. Robert T. Davis, of Fall River, and Dr. Washington Ayer, of San Francisco.

"Surgery before Anæsthesia," by John Ashhurst, Jr., M.D., of Philadelphia. Published in the last number of the INTERNATIONAL MEDICAL MAGAZINE.

"What Anæsthesia has Done for Surgery," by David W. Cheever, M.D., of Boston.

"The Birth and Death of Pain," a poem by S. Weir Mitchell, M.D., of Philadelphia.

"Relation of Anæsthesia and Obstetrics," by John P. Reynolds, M.D., of Boston.

"The Influence of Anæsthesia upon Medical Science," by W. H. Welch, M.D., of Baltimore.

"The Surgery of the Future," by Charles McBurney, M.D., of New York.

A New Publication Concerning Contemporaneous Literature.[1]

"The New Guide to the Press" (*Le Nouveau Guide de la Presse*) is the title of a publication which will shortly appear in Paris. This paper will give the most detailed information concerning all the journals and periodicals appearing in France and in foreign countries. Besides the ordinary descriptions, the names of the collaborators and principal correspondents and the price of subscription will be given. The work will be the most complete of its kind which has appeared up to the present time.

Reference to its contained material will be very easy because the journals are classified not only by cities but also by periodicity, opinions, politics, and subject. M. E.-G. Raymand is the editor.

The Death of Sir John Erichsen.

In the death of Sir John Erichsen, which occurred September 23, the medical profession as a whole and the British surgical profession particularly loses one of its leaders. Sir John Erichsen was born in 1818 of Danish parents. He received his medical education at the University College Hospital, London, under the guidance of Liston. At the early age of thirty-two he was appointed professor in the University College and became professor of clinical surgery in 1866 on account of the vacancy left by the death of Quain.

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[1] Bulletin médical du Nord, August 28, 1896.

He held this position until 1875, and during the time that he held the chair he became famous as a clinical instructor. His fame as an author is no less great than his popularity as a teacher. Among his published works may be mentioned "The Science and Art of Surgery," which appeared in 1853. This work was for a long time the English authority in surgery. During his career he has been at different times president of the Royal College of Surgeons of England, president of the Royal Medical and Chirurgical Society, president of the Surgical Section of the International Medical Congress of 1881, and, at the time of his death, emeritus professor of Surgery in the University College. Sir Joseph Lister was one of his pupils.

The International Congress of Obstetrics and Gynecology.[1]

The second session of the International Congress of Obstetrics and Gynecology was held at Geneva during September of this year. The president, M. Aug. Reverdin, occupied the chair. The first session of this Congress was held at Brussels in 1892, and the next will be held at Amsterdam. More than two hundred foreign colleagues were registered at this meeting. Addresses were made at the opening session by M. Lachenal, president of the Confederation; by the counsellor of state, Richard; and Drs. Simpson, of Edinburgh; Kebra, of Heidelberg; Polk, of New York; Tournay, of Brussels; Charpentier, of Paris; Gutterez, of Madrid; Stauch, of Moscow; Morisani, of Naples; Lindfers, of Sweden; and Chadwick, of Boston.

Among the important questions discussed were the treatment of pelvic suppuration; the treatment of retrodeviations of the uterus; the relative frequence and the most usual forms of narrowing of the pelvis in different countries, groups of countries, and districts; and the treatment of eclampsia.

The Founder of the Red Cross Society.[2]

Henri Durant, who originated the Red Cross Society, the good deeds of which in time of war and of pestilence need not be dwelt upon here, is sick and penniless in his old age. It should be the duty as well as the privilege of all nationalities to contribute to a fund which a special committee in Stuttgart is endeavoring to raise in his behalf. The committee has issued a circular which, in part, says, "He was an international hero. It should be the concern of all the people to charge themselves with the care of one who has cared so wisely and successfully for his fellow-men." Contributions may be sent to the committee, in care of the Burgomaster of Stuttgart. There should be a generous response to this appeal.

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[1] Gazette des Hôpitaux, September 15, 1896.

[2] American Medico-Surgical Bulletin, September 13, 1896.